# THE MODERN HOSPITAL

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## MODERN TENDENCIES IN HOSPITAL DESIGN


By RICHARD E. SCHMIDT, F.A.I.A., of Richard E. Schmidt, Garden & Martin, Architects, Chicago


*Most important of elements in modern hospital design is the tendency to plan for the future growth of the institution in an orderly, efficient, convenient and esthetically satisfactory manner, according to Richard E. Schmidt, head of a prominent firm of hospital architects in Chicago. This means, he says, a determination at the outset of the approximate ultimate capacity and scope of the institution, an estimate of what the community will require in hospital service at the end of twenty years. Far-sighted boards of trustees are purchasing when construction is contemplated, he declares, all the land required for the ultimate needs of the institution so as to forestall the continuing increment of cost.*

A NUMBER of tendencies in the design of new hospitals are now very pronounced. Some of them have been given more or less consideration in the past, but hardly a single new hospital project is developed today without having certain factors thoroughly studied, exhaustively analyzed, the advantages and disadvantages planned schematically and tabulated by the architect and submitted to the building committee for its consideration before the working plans are begun.

One of the most important elements among these is the planning for the future growth of the institution in an orderly, efficient, convenient and esthetically satisfactory manner, which means the determination at the outset of the approximate ultimate capacity and scope of the hospital. To estimate what the growth of the community will demand in the form of hospital service at the end of twenty or twenty-five years, then to make rough plans of the buildings which will be required eventually, and to determine the area of land necessary to accommodate the various buildings properly, are not easy tasks. Wherever possible, boards are buying at the outset all of the land required for the ultimate institution in order to forestall the continuing increment of cost, notwithstanding the fact that the immediate needs of the community may not demand more than a fraction of it. Ample space is left not only for development in the light of the most advanced present day practice, but also for improvements which will be certain to arrive from time to time.

The number of beds in wards is decreasing. The proportion in numbers of single bedrooms to wards is constantly growing. Individual rooms are being equipped with more plumbing than formerly; in some instances every private room has a running water lavatory, in others an adjoining toilet room contains a water closet with a swinging hot and cold water spout, a lavatory and shower.

Substitution of shower baths for bathtubs is steadily increasing. Showers are unquestionably more sanitary, occupy less space and require less labor for maintenance.

Provisions for complying with the recommendations of medical and hospital organizations to raise the standards of hospital technique has brought with it a requirement for adequate laboratories, not the small affairs of former years for urinalysis and other simple work, but larger and better equipped scientific workshops with highly trained staffs.

Recommendations of these organizations also require properly situated rooms for the preparation, filing and examination of patients' records. These quarters are being so arranged that complete records can be filed and will be available at any time; space is reserved for a historian and

typist, and tables for the examination of records are provided.

### Tray Service Grows More Popular

A comfortable room, large enough for a meeting of the entire medical staff, monthly or quarterly, is being provided in those new hospitals which expect to be abreast of the times.

Serving food direct from the cooking apparatus in the kitchen to the patients, commonly termed "tray service," is the tendency. At first attempted only in small hospitals, it is now in successful operation in at least one institution of 400 beds. This food service requires more complete elevator or dumb waiter equipment than other types.

Mechanical ventilating is being limited to the removal of air, vapor and odors from kitchens, toilet, bath, utility and sterilizing rooms, laboratories, operating and assembly rooms. Fresh air enters through windows, doors and cracks; such is the arrangement almost everywhere except for occasional assembly and operating rooms. A fresh air supply system with air washing devices maintained in perfect operation would be a valuable agency in the recovery and well being of patients, but neglect of the air washing device for only a short period will allow the ducts to fill with dust which is impossible to remove and which sifts into the rooms for a long time after the washing device is again in operation. This occurrence in hospitals has made, together with operating costs and failure to install humidity control, such systems taboo.

The fresh air supply to operating rooms is being tempered, filtered and conducted in relatively large, short, straight ducts, every part of which can be kept clean.

The cost of ice and additional labor has made mechanical refrigeration more economical, and new hospitals are almost universally being thus equipped.

### Water Sterilized in Boiler Room

Central systems of sterilizing water are coming more into use and the notion that water sterilized in the boiler room cannot be piped in the operating or dressing rooms in a sterile condition has been demonstrated to be without scientific foundation. It has also been established that sterile water can be supplied in this manner in almost an unlimited quantity much more cheaply than it can be produced in comparatively limited quantities in a large number of sterilizers scattered about the hospital, each of which consumes steam, gas or electricity.

Push button type elevators and dumb waiters have come to stay. Dumb waiters of today are so much larger that they are practically elevators. The tendency is wholly towards electric operation. Where food service is of the tray type, one dumb waiter is installed for each story; elevators are being equipped with a self leveling device.

### Walls Now Decorated in Color

More thought than formerly is being given to selecting sites for new hospitals at a distance from noise-producing agencies, among which are surface car lines and railroads. Deadening or absorbing sound within the walls of the hospital is also being given consideration. Special wall plasters, floor surfaces, floor and partition construction, doors and subdividing corridors are in use; it is now known in what manner sound can be absorbed and quiet created, but the expense of applying it in a thorough-going manner on a large scale does not seem to be within the reach of hospitals.

The use of colors for floors, walls and ceilings of operating rooms in lieu of white is now general. Different shades of gray greens or warm grays, all without gloss or luster, are being used extensively; dead black is even employed in a few instances. This extreme seems neither necessary nor logical.

There is a reversion from having everything in the wards white and without ornamentation; this idea was held and admired as sine qua non for a long time. Now a more sensible view prevails that tints of color are more pleasing and restful to the patient and do not lower the standards of cleanliness and sanitation; consequently artistic tints are being widely used, but not so many as to attract attention.

### Offices Take on Hotel Aspect

Much more thought is being given to the comfort of the nurses and the provisions which should be made to encourage proper service, such as rest rooms, showers and dressing rooms for special nurses, who generally live at a distance from and must spend many days in the hospital leaving their patients' room only occasionally. They should have a place where they can go for a short time for a rest or change of clothing or to remain when the presence of their patients' friends makes it tactful to withdraw.

Not many years ago the office or clerical work of comparatively large hospitals was quite limited and two rooms were sufficient for the accommodation but it has grown to such a volume and so many functions have been added that old hospitals have been obliged to increase the office quarters and new hospital offices are being designed similar to those of a large hotel. Registration desk, room clerks, bill and information desks, telephone switchboard room, bookkeepers' room,

statistician room, auditor's room, stationery room and superintendent's private and public offices are being provided and separated so as to function without interference or confusion. Furthermore there must be waiting rooms and private offices for the officers of the training school, and separate toilet and locker rooms for the office help. All of these rooms are arranged and equipped to carry on the business of the hospital quietly and efficiently in a manner similar to that of any well regulated business enterprise.

### More Rooms for Maternity Cases

Receiving and store rooms for the vast amount of food stuffs, drugs, medical supplies, fuel, furnishings, etc., consumed annually are being planned so that their contents may be weighed, counted, checked and inventoried when received, delivered on requisitions to the cook, pharmacist, operating nurse, engineer, housekeeper or other employe in charge of the respective departments and responsibility placed for their consumption or loss.

Obviously, there are separate rooms for the proper storage of the many kinds of articles, some of which must be cool, others in which temperature is negligible, but all of them under the direct control of a receiving clerk.

The ratio of maternity cases to the whole number of hospital cases has been growing rapidly and more adequate provision for them must now be made than in the past. Where formerly one birth room was sufficient, two or three are now required, sufficiently isolated and soundproof so as to allow them to function without disturbance to other patients. It is no longer necessary to confine a mother in any kind of a room because the delivery rooms are already occupied. Rooms for prenatal and infant clinics are being found necessary and extremely valuable in welfare work; where this work is done an office for the social welfare nurse and her assistant is provided.

### Anticipating Growth of Out-Patient Service

Out-patient departments are not innovations, but for many years their value was not recognized. Today their space requirements have grown to large proportions and almost every branch of medicine is practiced. No mistake can be made in setting aside considerable space for such a department, notwithstanding the fact that it may not be finished off and equipped at the outset.

A conveniently located separate entrance, with waiting rooms, space for perambulators and wheel chairs, examining desk, card files, toilet rooms, and appropriate examining rooms for various services, is an obviously necessary arrangement.

The words "roof garden" seem to have an unusual charm, for there is a disposition to build roof gardens everywhere, notwithstanding that local meteorological conditions may not be promising. They are being built in the far north and as well as in locations where ground is cheap. In the first instance, patients can make use of it only a few days of the year; in the latter they would enjoy the outdoors more and find conditions more pleasing in an old fashioned garden, surrounded by trees, plants and flowers such as no roof garden can boast. Not only are roof gardens growing more numerous, but their equipment more extensive and costly. They require tile floors, enclosed, covered and uncovered areas, toilet rooms, good pantries and a securely guarded high parapet wall.

### Kitchen No Longer Near Roof

Today's trend is not to place kitchens in upper stories. The cost of elevating fuel and all supplies seems too great and the claimed advantage that kitchen odors do not permeate the building as much from these higher locations as they do from kitchens in lower stories has not been proved. The much greater cost of gas than coal as a kitchen fuel and the cost of elevating coal and lowering ashes has possibly influenced this tendency.

Whether patients should be anesthetized in a special room or in the operating room, and what is the relative importance of having an anesthetizing, sterilizing or surgeon's scrubroom connected to the operating room are questions that have not been settled. Those who have had occasion to put these queries to many surgeons do not find agreement.

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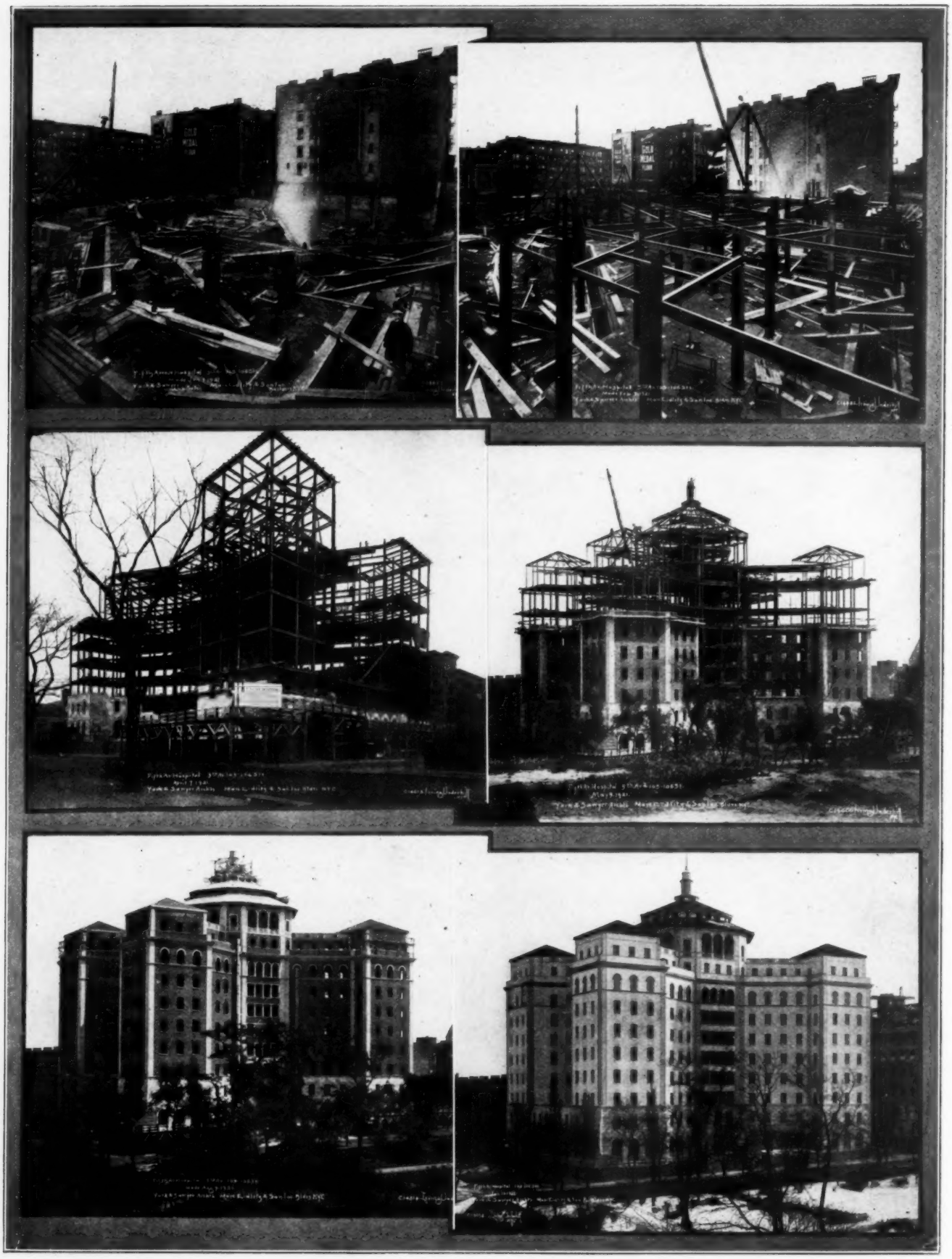
## TO MAKE ASSOCIATION MEMBERSHIP QUALIFICATIONS UNIFORM

"Confusion and misunderstandings have developed among state hospital associations from the fact that the wording of qualifications for personal membership in the constitutions of the several geographical sections differs from that of the American Hospital Association," says Dr. A. R. Warner, executive secretary of the national organization.

"After a consideration of the far-reaching effect of this on the future," Dr. Warner declares, "the trustees of the American Hospital Association have by appropriate resolution expressed the opinion that the harmonious and effective organization of the field requires that these qualifications be identical in all geographical sections. The president has therefore been authorized to appoint a committee on which all geographical sections will be represented, with himself as chairman, to determine upon a wording acceptable to all sections. The American Hospital Association will then adopt this wording. Established memberships can of course not be modified or affected in any way."

PROGRESS PHOTOGRAPHS OF THE NEW FIFTH AVENUE HOSPITAL, NEW YORK



# PLANNING AN EFFICIENT WARD UNIT

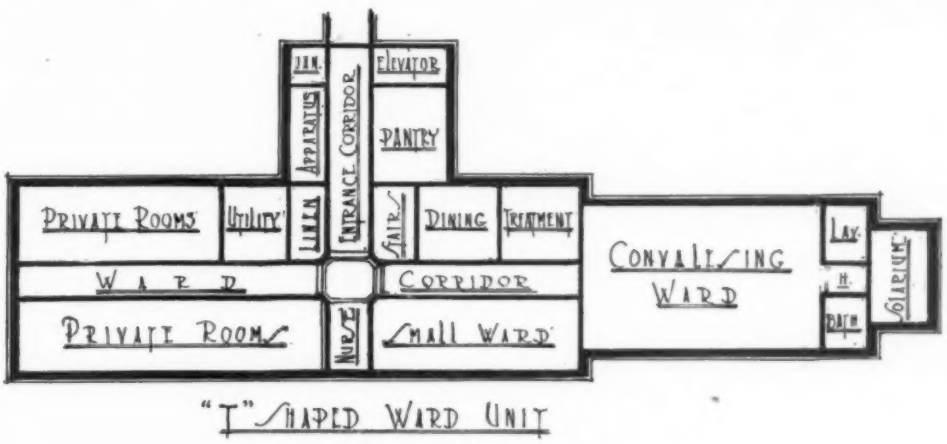
By R. G. BRODRICK, M.D., Director of Hospitals for Alameda County, San Leandro, California

THE ideally planned ward unit is one that best serves the patients with the least amount of lost energy on the part of hospital attendants. To accomplish this, the important requisite is *the central location of utilities.* These are not conveniently placed in most hospitals as, for example, in the corridor-pavilion type where the service is usually arranged at one end of the ward. Investigations made by Dr. Gilman Thompson reveal that the average nurse during eight hours of ward duty walks over five miles. Hence, proper arrangement of service rooms will reduce her work by lessening the time and energy spent in walking corridors.

On account of extreme variations in hospital problems it is impossible to adopt a standard plan for a ward unit. Local conditions will determine its size and shape. Standards, however, can be established for proper location of service rooms and essential details of equipment.

## In the T-Shaped Ward Unit

When the site and requirements permit, the H-shaped hospital building or the inverted T-shaped ward unit lends itself most ideally to the proper placement of service rooms in relation to wards and private rooms for patients.




T-Shaped ward unit.

Here the nurse's station is placed in the center of the ward unit at the intersection of the entrance and ward corridors.

The serving pantry, elevator, apparatus room and janitor's closet extend along the entrance corridor so that, although convenient to the ward, the noises incident to their operation are kept from patients.

In a ward for the acutely ill, about one-half of the patients are apt to be in serious condition, some of them dying, perhaps, and the remainder convalescing. The nurse's steps can be confined to the smallest possible radius by segregating patients who are seriously ill in separate rooms at one end of the ward corridor and close to the nurse's station.

The utility, or sink room, on account of its frequent use by nurses attending bed patients must be within immediate proximity to these private rooms. No other service room should be interposed between the nurse's station and rooms occupied by patients critically ill.

## What to Locate in Dark Corners

The linen storeroom can be well placed in the dark corner formed by the intersection of the perpendicular and horizontal axes; here it will be convenient to bed-ridden cases, who use most of these supplies. The stairway, enclosed, placed in the opposite dark corner and opening directly upon the administrative center of the ward is under the direct supervision of the nurse.

The remaining portion of the ward unit is set aside for convalescing patients. The treatment room and the dining room, both used chiefly by convalescents, are centrally placed, while at the extreme end of the building, beyond the ward, the solarium permits those frequenting it to enjoy sunshine, open air, and one another's company, removed from the depressing atmosphere of the hospital.

To lessen congestion and noise about the center of the unit, baths and toilets for convalescing patients are placed at the farther end of the ward and adjacent to the solarium.

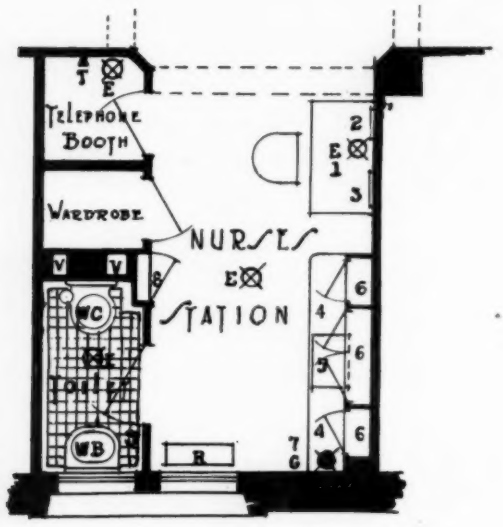
The details of these service rooms, which perform such an important function in the hospital

of today, must be thoroughly worked out. Only in this way can the maximum efficiency of the hospital personnel be developed. Rooms should be planned about equipment, which in turn must be arranged in proper circulation and must answer the requirements of the service to be performed.

The space allotted to this article permits only of the description of the principal service rooms.

## The Nurse's Station

When located opposite the entrance corridor the nurse is enabled to control completely all avenues of communication, supervise the patients and meet members of the staff and visitors upon their entrance to the ward.




EQUIPMENT OF NURSE'S STATION

1. Desk.
2. Annunciator.
3. Bulletin board.
4. Case.
5. Sink.
6. Medicine cabinet.
7. Gas plate.
8. Panel board.
E. Electric.
G. Gas.
R. Radiator.
S. Switch.
T. Telephone.
V. Vent.

The nurse is provided with chair and desk (1) for clinical records. On the wall above are the annunciator (2) for nurse's call, bulletin board (3), and electric light fixture.

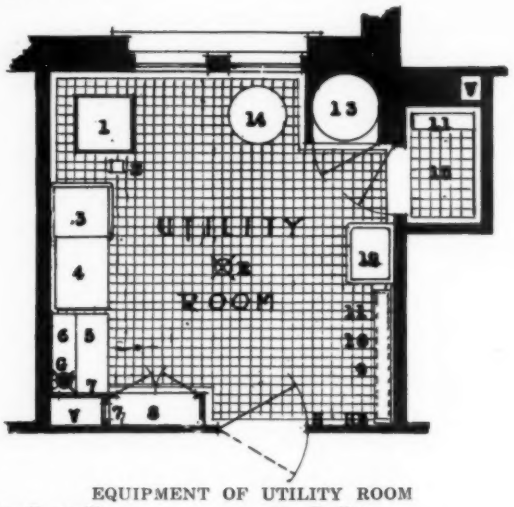
Adjacent is a case (4) with counter and sink (5) made of soapstone to resist the chemical action of drugs. Above the case is the medicine cabinet (6) provided with sash doors and opalite shelves. The corner compartment, wherein poisons are kept, has a bull's-eye signal in which a lamp lights when door is opened. A gas outlet is provided for the plate (7) whereon hypodermic syringes and needles are sterilized.

On the opposite side are a nurses' lavatory consisting of toilet and wash basin with mirror above; a vented wardrobe for nurses' wraps; and a ventilated, soundproof telephone booth.

In the wall is the electric panel board (8), so placed that the nurse may readily operate the light switches.

Thoughtful consideration must be given in locating and arranging the important service of the utility or sink room. Much of the arduous duty of the nurse is performed in this room, therefore every effort should be made to conserve her energy and lessen her steps by proper circulation and adequate equipment.

It must be large enough, at least 120 square feet, well lighted by an outside window, and provided with mechanical exhaust ventilation so that no odors may pass from it to the corridor or rooms of patients. The partitions may be sound-deadened.




EQUIPMENT OF UTILITY ROOM

1. Utensil sterilizer.
2. Floor drain.
3. Pack sink.
4. Drain board.
5. Work table.
6. Shelves.
7. Exhaust ventilation.
8. Specimen cabinet.
9. Utensil rack.
10. Drip pan.
11. Radiator.
12. Clinic slop sink.
13. Clothes chute.
14. Soiled linen hamper.
15. Dryer.
E. Electric.
G. Gas.
H.B. Hose bibb.
S. Switch.
V. Vent.

Bedpans and urinals are emptied in the clinic slop sink (12), where they are thoroughly scrubbed by brush in running water. When required, they are disinfected in utensil sterilizer (1) and then hung in rack (9). Beneath, and attached to the wall, is a nickel-plated copper pan (10) to catch drip from wet bedpans and urinals; it is flushed by a compression bibb (HB) and drains into soil pipe. The radiator (11) is placed beneath the drip pan so that the ascending heat dries bedpans and urinals and keeps them warm.

The combination bedpan and excreta sterilizer, complicated in design and frequently out of order, should be reserved for isolation wards where it becomes necessary to disinfect excreta from patients affected with intestinal-borne diseases, as typhoid fever, amoebic dysentery, etc., so that the infection will not be transmitted through the medium of sewage.

Twenty-four hourly specimens of urine, also

excreta for physicians' inspection, are kept in the ventilated cabinet (8) with perforated shelves; beneath is a locker for storing specimen bottles.

The work table (5), used extensively by the nurse, must be of adequate size and well placed. Here are prepared enemas, irrigations, compresses, douches, etc.; above are shelves (6) for necessary supplies, as flaxseed, mustard, magnesium sulphate, turpentine; below, a shelf for basins, pitchers and irrigators. These shelves, as well as the counter, on account of moisture should be marble.

A gas plate (G) for heating solutions and poultices and an insulated drawer to hold cracked ice are provided.

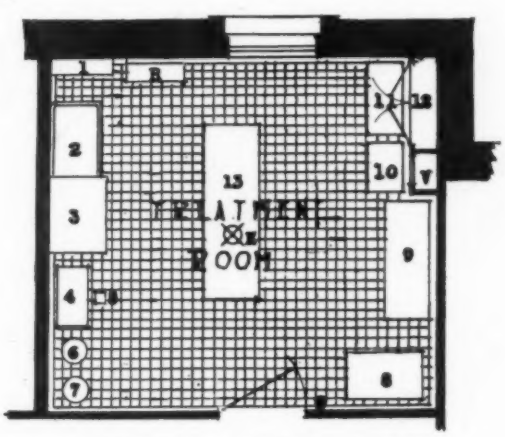
Sheets and blankets used in wet-packs are immersed in the deep sink (3) provided with a hardwood base for wringer attachment and ash drain board (4). Beneath the wringer is a floor drain (2). Wet articles are dried in the heated closet (15), which is also used for warming blankets.

Soiled linen should be handled in a sanitary as well as economical manner. Deposited in the hamper (14), it is counted, replaced in canvas bag, which is then dropped through a clothes chute to basement.

## The Treatment Room

This room, used for examining patients, making diagnostic tests, applying surgical dressing and performing minor operations, should be so equipped that the patient receives proper care without unnecessary suffering.

In special wards, such as genito-urinary, maternity, etc., different arrangements for the particular type of cases treated must be made. This article deals only with the essentials common to all.




EQUIPMENT OF TREATMENT ROOM

1. Marble shelf.
2. Surgeon's sink.
3. Drain board.
4. Instrument sterilizer.
5. Floor drain.
6. Cold sterile water.
7. Hot sterile water.
8. Dressing carriage.
9. Shelf stand.
10. Instrument table.
11. Dressing table.
12. Instrument case.
13. Examination table.
E. Electric.
R. Radiator.
S. Switch.
V. Vent.

It is best located on the ward corridor near the convalescing patients, whose needs it chiefly serves. Bed patients, owing to their serious condition, are more conveniently examined and treated in private rooms. The entrance door, however, must be at least forty-two inches wide, to permit patients to be brought in their beds when necessary.

In general, for convenience of service and economy of "roughing-in," the plumbing fixtures, consisting of sink and sterilizers, are arranged on one side, while on the opposite side of the room are the tables and cases used in common. In the center is placed the examination table (13) with sufficient working space on all sides.

Near the sink (2) for surgeons' and nurses' "wash-up" is a marble shelf (1) for liquid soap and hand brushes, also an ash drain board (3) for convenience to the nurse.

Grouped together are the instrument sterilizer (4) and cold (6) and hot (7) water sterilizers. Beneath is placed a floor drain (5) to carry off the overflow that frequently occurs, especially from the instrument sterilizer.

On the opposite dry side instruments are kept in a recessed, built-in metal case (12), the glass doors of which open above the adjustable instrument table (10) and the table (11) for "set-up."

A shelf-stand (9) for holding solution bottles, utensils, etc., and dressing carriage (8), placed conveniently near the door, complete the equipment.

## The Ward Diet Kitchen

A common fault is to build the ward diet or serving kitchen, by far the most used of the ward utilities, entirely too small. At least 200 square feet are needed to provide sufficient work room and space for proper arrangement of adequate equipment so that hot, palatable food may be quickly served to patients.

It must be centrally and conveniently located so that the trays may be served by the nurse with the least possible labor and delay. The ideal location is on the entrance corridor not too far from the nurse's station. Odors of cooking, as well as unavoidable noises incident to handling of dishes, will be kept out of the ward corridors and away from patients.

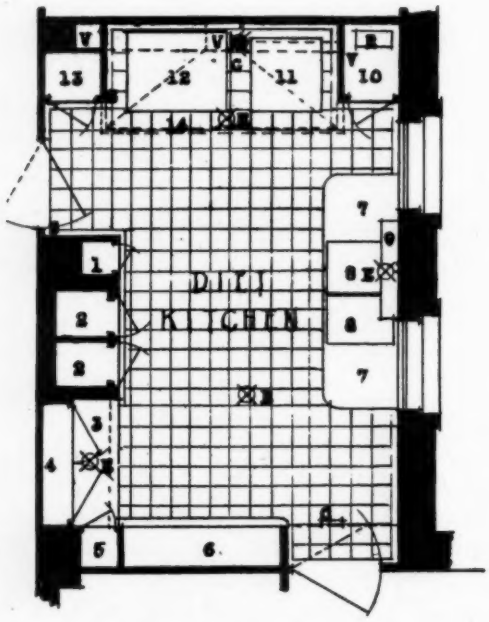
Food from the main kitchen is readily transported to the ward diet kitchen by means of an electrically operated dumbwaiter. This should be provided with an automatic device that lights a lamp within as the dumbwaiter reaches the ward floor. When the dumbwaiter supplies several floors, an indicator over the door shows its whereabouts.

An intercommunicating telephone system con-

necting the ward serving pantries with the main and special diet kitchens promotes efficiency. If, by reason of the extent of the hospital, it is not feasible to lift the food directly from the main kitchen to the ward diet kitchens, trucks must be employed.

These food trucks should be small, of light construction, equipped with rubber wheels and the upper shelf provided with openings in which heated aluminum steam table inserts containing hot food are placed. They are lifted in automatic elevators which open upon a separate corridor adjacent to the ward diet kitchen with which it communicates. The food truck does not pass through the entrance corridor.

A hinged elevator door, one end of which, resting on a roller, describes a quadrant, facilitates rapid delivery. Lining the door and sides to a height of forty-eight inches with cork greatly lessens noise in handling these trucks and reduces cost of upkeep.




EQUIPMENT OF DIET KITCHEN

1. Locker.
2. Refrigerator.
3. Counter.
4. Cupboard.
5. Bread locker.
6. Tray shelves.
7. Drain boards.
8. Sink.
9. Marble shelf.
10. Dryer.
11. Gas stove.
12. Steam table.
13. Broom closet.
14. Hood.
C. Clock.
E. Electric.
G. Gas.
R. Radiator.
S. Switch.
V. Vent.

The fixtures for cooking and serving hot food, consisting of gas stove (11) and steam table (12), are placed together under a vented hood (14) in front of which the wall is furred from the ceiling to eliminate cleaning and painting of the upper surface of hood. The under surface of this hood is lined with glazed tile continued up from rear wall; this makes a sanitary surface easily cleaned. The steam table (12) provided with openings for heating aluminum inserts and pans containing hot food sent from kitchen should have: (a) Front nine-inch serving board. (b) Nine-inch splashback. (c) Steam valves and coils for separately heating bain-marie pan above and dish warmer below, so that dishes may be heated without overcooking the food; painting valves distinguishing colors, e. g., steam valves white, water valve green and drain valve yellow, prevents maids from operating the wrong valve through ignorance. (d) Spring hinged drop doors for the dish warmer which close when not in use. The sliding door is worthless, since it is always left open.

The gas stove (11) with four burners and upper oven is essential for cooking "specials" and for night use.

A five-gallon hot water urn, steam heated, is convenient for making fresh tea. Pots containing tea balls are kept on steam heated shelves below.

Trays, set up on shelves (6), are transferred to the tray carriage stationed beneath and, after being supplied with food, are conveyed to patients.

A mechanically operated clock (c) stimulates prompt service.

## Storage of Food and Supplies

The facilities comprising refrigerator (2) and cupboard (3 and 4), used in common, are placed adjacent. The counter (3) is for making salads, preparing cold foods, butter-slicing and bread-cutting. The case below contains drawers for flatware and lockers for linen. Above the cupboard (4) provides storage for certain foodstuffs kept in enameled containers, and for glassware and crockery used cold.

A metal vented bread locker (5) opens through a door with adjustable lourve directly on the work counter. The refrigerator (2), of stock type, built in, is of large size, being 48 inches wide, 25 inches deep, and 60 inches high, with three food compartments and one to hold 200 pounds of ice. If desired, mechanical refrigeration may be substituted. The inner surfaces should be of non-absorbing material, preferably solid porcelain with rounded corners. Four doors are used to lessen loss of refrigeration.

The drain communicates through a pop valve, readily cleaned, with trapped floor drain in front. When the floor drain is beneath the refrigerator it is apt to be wholly neglected until the discharge causes an obstruction in the drain pipe, which, therefore, should be of large diameter.

Soiled dishes are placed upon the scrapping drain board (7), beneath which is a container for swill, and are then thoroughly washed and ster-

ilized either in a mechanical dishwasher or, more simply, in a double compartment galvanized iron sink with a live-steam connection so that the dishes are scalded in water at temperature of 180 degrees Fahrenheit, sufficient to destroy such virulent germs as the bacilli of typhoid, diphtheria and tuberculosis. A marble shelf (9) placed at convenient height above for washing powder, and electric wall-bracket light with switch, facilitates this rather arduous labor.

Wet dish towels, brushes and mops are dried in the vented closet (10), tile lined, steam heated and provided with a metal-lined door with grill below.

A vented closet (13) provides a proper place for brooms, brushes, etc., above which is a shelf for such supplies as soap, soda and cleaning powder, which should be kept away from food.

A ventilated locker (1) near the entrance provides a proper place for the maid to hang her outer garments, which should not be left in the diet kitchen.

In the interest of economy and on account of its beneficial effect upon patients, meals should be served to convalescents in a dining room situated on the ward corridor and communicating directly with the serving pantry.

# THE ARCHITECT AND HIS EMPLOYERS

By HENRY H. KENDALL, F. A. I. A., Boston

WHILE the title, "The Architect and His Employers," is a broad one, it is my intention to consider only a limited application of this relationship, the one in which the employer is the executive of a hospital,—its building committee, its superintendent, its trustee, director, or whoever or whatever the person or body may be to whom authority to employ is given. Architects are often of a simple and trusting nature, and frequently it is distasteful to them to inquire whether the party who suggests the planning of a hospital building has any right to employ or incur indebtedness on behalf of the institution.

*There exists between you and your architect a great need for confidential relations, for full and free discussion with him of every feature of your problem. Are your means limited? Tell him frankly. Are you willing to put up with makeshift accommodations until such time as you can afford what you desire? Tell him. He can often show you how to plan for present use and later convert the structure to other purposes at a minimum of expense and sacrifice. After your plans are perfected, do you find that certain additions are necessary? Do not tell your architect to make them, and then when their cost exceeds your preconceived ideas, blame him for the excess.*

## Should be Mutual Understanding

There will always be opportunities to render unpaid service, but both employer and architect ought to realize that it is unfair to ask or to render such service without some definite understanding. A service is usually worth just about what you pay for it. If unpaid service is offered by an architect it is always with the hope, if not the expectation, that, by what is called "moral obligation," or by the exclusion of other architects on the ground that he was the first to be consulted, he will secure the job.

Both employer and architect should fully understand their respective authorities and advise each other at the outset just what their powers and limitations are.

Recently I heard an architect who had been at work, in conference with a superintendent, for eight years or more on plans for a new hospital building. A scheme satisfactory to the superintendent and the medical staff has been worked out, but when actual building was to be started it was found that neither superintendent nor architect had any authority to act; thus the work of eight years went into the discard without any compensation to the architect.

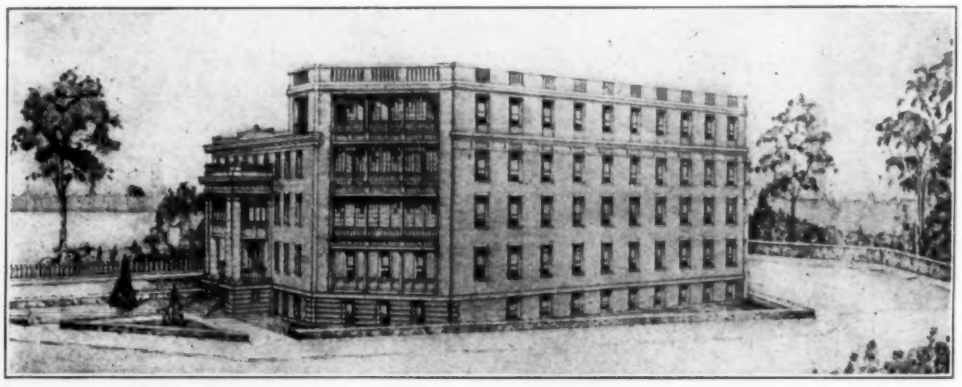
Similar instances could be cited indefinitely. An interested trustee, the president of the corporation, a member of the building committee, all anxious to serve the hospital or to further the interests of a friend, will request sketches without a second thought as to who will pay for them or whether they will or should be paid for at all.

It is unfortunately true that architects themselves have, in their anxiety to secure business, aided and fostered this abuse; but I believe that it is no more right for a board of trustees to take an architect's service, much or little, without adequate compensation, than it would be for the architect to enter a store and take goods from the counter without thought of payment. The latter we call shoplifting and punish accordingly; for the former we have not as yet coined a satisfactory name.

Therefore let us be sure that the authority to employ has been duly given and that the limits of authority are clearly understood by both representative and architect.

## Formal Contract is Good Practice

There is frequently a very annoying lack of definite understanding as to what service the architect should render and what he should be paid for such service. A general practice is to assume that what is called the "minimum rate," generally accepted and recognized by the courts as six per cent of the cost, is an understood and sufficient payment for all and every service that may be demanded of the architect.



The proposed new Rockaway Beach Hospital building, Long Island, as visualized by the architects, Resler & Hesselbach, of New York, who momentarily anticipate authorization to proceed with its construction.

This sometimes leads to misunderstanding and it is becoming more and more the practice to execute a formal contract between employer and architect stating clearly the service to be rendered and the returns therefor, or, in case this is deemed too formal a procedure, to embody in a letter a statement covering such points. The American Institute of Architects has prepared forms of contract between owner and architect covering several methods of employment which when used either as printed or as the basis of correspondence, adequately cover the points in question.

The superintendent is usually the authorized spokesman of the employing body, and rightly so. He alone has his hand and mind upon every detail of the organized work of the hospital. He knows the details of procedure as no member of the board or building committee can. He understands the daily routine of administration and what the duties of each group or individual are. He has had a part in the management of other institutions and knows, often from bitter experience, what errors in planning or arrangement can be made. If a man of force and ability, he will have definite ideas as to where and how he wishes his units arranged; all of this information he will bring to his architect. On the other hand, the architect, if he is the man of experience he should be, will be able to bring to such consideration other solutions of kindred, if not identical, problems.

A superintendent with a national reputation, with whom I have been associated for many years, once said, "My architect and I often disagree. When we do, we sit down and thresh it out; sometimes I win out, sometimes he, but we do not *do* anything until we are agreed on the best way to accomplish it; and we are the best of friends today, after a score of years' service."

The superintendent is, I have said, properly the mouthpiece of the employer; but he, too, is, or should be, ever mindful of the power back of him. He should keep in touch with the members of his board or committee and be sure that his acts meet with their approval. A radical innovation or new idea should be thoroughly understood by them before execution. I once was asked, "Why did you permit this? Superintendents come and go, but your building will endure through the service of many superintendents."

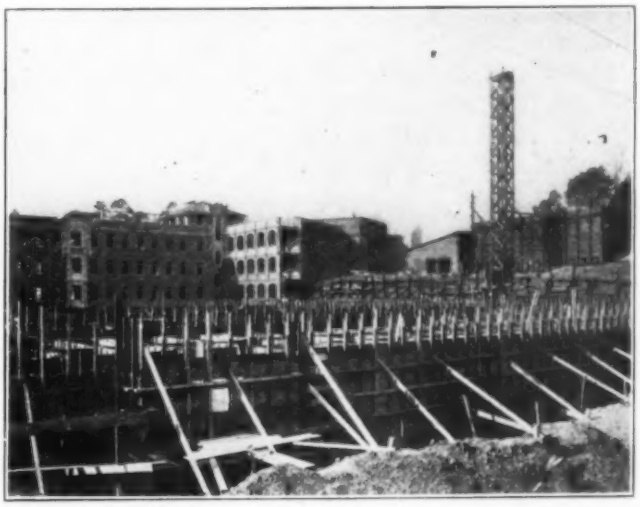
The architect is a technical adviser, an expert in bringing to pass things conceived and desired, the mechanical methods of realizing which are

Leominster, Mass., is soon to boast this attractive home for Leominster Hospital, the drawing of which is furnished by the architects, Kendall Taylor & Co., of Boston.

A general view of Highland Hospital of Alameda County, Cal., now under construction in the city of Oakland, as it will appear when completed. The central administration building is not shown in this photograph. The structure will be made up of seven buildings of three stories, basement and roof garden each, and will have a capacity of 650. When completed the building will represent an investment of $2,000,000.

beyond the training of officers who see the need and suggest the idea. The patient who comes to the hospital knows his need of care and of protection from infection and all the hazards of illness, but he cannot tell the doctor or the nurse how these things are to be done. He trusts to them in full confidence that all that is humanly possible will be done for him.

So, it seems to me, must the superintendent and the building committee come to the architect. They must place before him their needs, their problems, the results they desire to attain; and it is the architect's job so to plan that these things may be done economically and with permanence and convenience.



Wards 4, 6 and 8 of Highland Hospital as they look at the present time. In the distance is seen Ward 2 completed on its exterior but without windows. Note the service building in the rear and the sections through the communicating corridors.

This leads me to the statement that it is of primary importance that the relation between architect and employer should be one of mutual confidence and trust. In few other relations in life is such absolute dependence of one upon another exercised as that between employer and architect. Vast sums of money are expended because the architect so specifies and his judgment is final in almost all problems of construction. In details of finish and decoration the employer exercises a measure of control, but his dependence upon the architect's skill and knowledge in all the larger problems is absolute. Rarely does he exercise more than perfunctory supervision of construction or study with understanding, specifications.

Therein lies the great need for confidential relations between the two parties. Therein lies the need for more care in the selection of an architect and for a full and free consideration with him of every feature of the problem. Are the means limited? Tell him frankly. Are you willing to put up with makeshift accommodations until such time as you can afford what you desire? Tell him. He can often show you how to plan for present use and

In this photograph may be seen a panoramic view of Highland Hospital as it appeared several months ago. This contract is almost completed.

later convert the structure to other purposes at a minimum expense and sacrifice. After your plans are perfected, do you find that certain additions are necessary? Do not tell your architect to add them and then, when cost exceeds your preconceived ideas, blame him for the excess.

### Needs a Restraining Hand

On the other hand, the architect needs the wise counsel and restraining hand of the executive. He may wish to design a building or group that will be a monument to his artistic taste and a credit to the community. Such display is legitimate, if funds permit; an artistic structure is ever a delight. In this connection I recall the definition of an old English writer upon architecture, who said, "Well building hath three conditions: Commoditie, Fitness, and Delight." No structure is a real success that does not combine these three qualities and, however limited his means, the architect endeavors to so clothe his construction as to cause delight.

I have written this article with regard, principally, to the architect who is adept in hospital construction, for I think the board wise which selects someone especially experienced in the class of building it contemplates. There are cases where, for one reason or another, such a person is not selected. Undoubtedly the employer's choice falls upon someone who is, in his judgment, able to bring to the solution of his problems the requisite ability to meet the need, but the required study often takes more time than can be given. Some lessons come only by experience, and no board likes to be the subject of experiment. This may introduce a new function of the architect. The consulting, or associated, architect, who, bringing his wealth of practical knowledge to the aid of the architect retained by the employer, checks his drawings, criticizes his layout, and assists him in obtaining a satisfactory solution to the problems.

A hospital is not a group of rooms with sanitary bases, coved corners, tile floors, marble wainscots and flush doors. It is a great mechanism, functioning with the least possible friction, the fewest steps, the most easily supervised areas, and the most expert service, with the least expenditure of human energy. These vital elements may be the helpful suggestion which an associated architect, versed in the art and familiar with the essential principles of hospital planning, can contribute to the selected architect's plan, without in any way trenching upon his control of design and treatment of the buildings.

The keynotes of successful relations between an architect and his employer are ability, confidence, and experience, with a liberal allowance of patience and tact on both sides.

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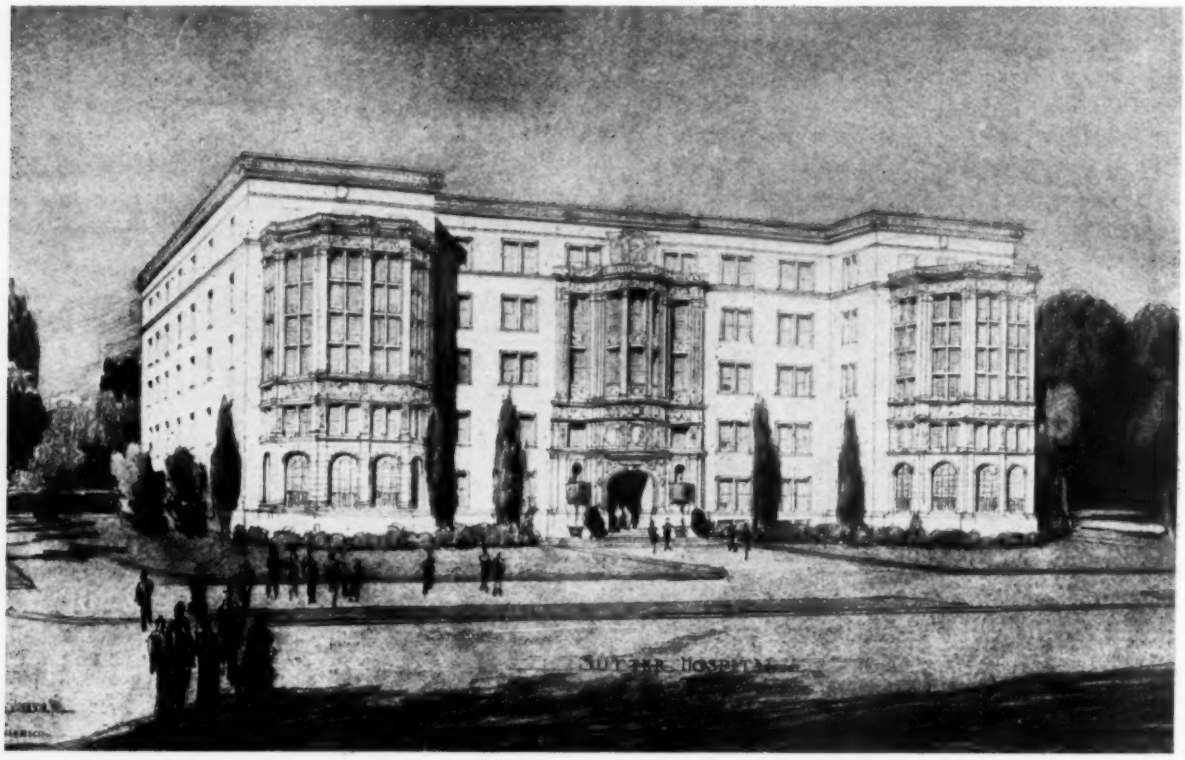
"It is a curious thing to observe how almost all patients lie with their faces turned toward the light, exactly as plants always make their way toward the light."—Florence Nightingale.



Sacramento, Cal., is to have a new building, Sutter Hospital, the above sketch of which has been drawn by Frederick H. Meyers, architect.

# SOUNDPROOFING IN BUILDINGS, WITH APPLICATIONS TO HOSPITAL CONSTRUCTION

By F. R. WATSON, Professor of Experimental Physics, University of Illinois

THE problem of soundproofing in buildings has received an increasing amount of attention because of the modern demands for the reduction of noise. Particularly in hospitals[1] is this true where the recovery of patients is hindered and sometimes seriously menaced by the prevalence of objectionable sounds.

Methods for insulating sound involve a number of perplexing problems. The theory of the subject is incomplete and the practical attempts to secure effective soundproofing are not always attended with success, even though the constructions are in accord with the theory and apparently have the elements of adequate insulation.[2] Sound progresses with facility through the different materials in the building structure in paths not easy to trace and may be heard in positions quite remote from the source. This action together with the extreme sensitivity of the ear in hearing explain why the insulation of sound is a difficult matter.

The Smith Memorial Music Building at the University of Illinois

## Two Types of Sound

The general problem of soundproofing involves a consideration of two types of sound. One type originates in the air by means of a violin, the voice, a clarinet, etc., and proceeds outward from the source through the surrounding air to the boundaries of the room. Here the energy may be transmitted to an adjoining room in three ways,—first, by passing through the air passages in ventilator pipes or other openings; second, by setting the separating wall in vibration so as to create sound waves on the further side; and third, as an elastic wave motion in which the pressures and rarefactions of the sound waves are transmitted from particle to particle in the wall and are communicated to the air on the further side. Experience shows that the escape of sound is usually greatest through the ventilation ducts so that, unless these vents are arranged in some special manner to hinder the transmission, it is a waste of effort to install soundproof walls or floors or other special constructions. Next in importance to the ventilation system in the transmission of sound is the vibration of walls. Sound pressures and rarefactions in one room set a wall in mechanical vibration and the wall, in turn, sets up sound waves in the air on the further side. The action is more marked if the wall is thin or if it is in tune with the sound. The amount of energy transmitted by elastic waves is usually small compared with the transmission by the vents and by wall vibrations.

## Disturbance Caused by Vibrations

The other sounds to be considered in soundproofing are the vibrations generated in the building structure by motors, pianos, elevators, street

1. "Sound Deadening in Hospitals," by Richard E. Schmidt, Surgery, Gynecology and Obstetrics, Vol. 31, pp. 105-110, 1920. An excellent article, including essential principles of soundproofing.
2. "The Insulation of Sound," by Wallace C. Sabine, The Brickbuilder, Vol. 24, pp. 31-36, 1915.

traffic, etc. These vibrations travel easily through the continuity of solid materials and, by setting up resonant movements in partitions or furniture, may create sound waves in air. It is more difficult to stop these vibrations progressing

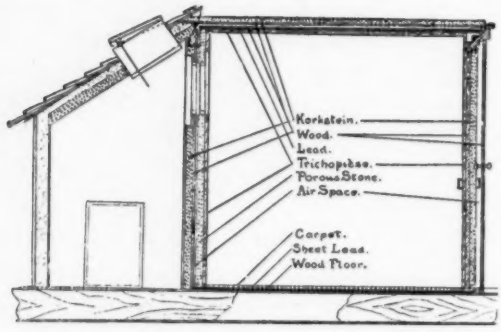



Fig. 1.—Section of noiseless room.

in the building structure than those passing through the air. The effective method of control, as in the case of the sounds in air, lies in the interposition of a discontinuity in the path of the waves. For instance, an air space in masonry is theoretically an effective barrier because of the marked discontinuity in elasticity and density between masonry and air. Practically, however, this arrangement is not effective because the discontinuity is not complete; the weight of materials necessitating a contact across the air space that allows easy transfer of the vibrations. An approximate solution is obtained by inserting air-filled materials such as hairfelt, flax, sand, etc., which while lacking the rigidity of solids are still able to sustain a considerable load; and also, because of the enclosed air, make a fairly complete break in the continuity of structure.

The construction of a soundproof room is suggested by the foregoing considerations. The boundaries of the room,—the walls, floor and ceiling—should be as rigid as possible with the necessary openings for doors, windows, ventilation and other openings guarded in special ways to prevent transfer of sound. Single rooms of this kind have been successfully constructed. Figs. 1 and 2 show the details of such a room.[3] The walls were eleven inches thick and constructed of successive layers of sound absorbing material, air, cork, lead, etc. Other instances of soundproof rooms could be cited,[4] but the special constructions and unusual features adopted would not be practicable for ordinary buildings where the effort is made to minimize the thickness of partitions and yet maintain the necessary qualifications of strength and fireproofness.

3. "A Noiseless Room for Sound Experiments," by S. I. Franz, Science, Vol. 26, pp. 878-881, 1907.
4. "Soundproof Partitions," Bulletin 127, University of Illinois Engineering Experiment Station, 1922.

The insulation of sound in an entire building is a more difficult problem than for isolated rooms. Attention in this case must be paid to all the features of the building construction whereby sound might possibly be transferred: the building structure, walls, pipes and particularly the ventilation system.

The attempt to soundproof the Smith Music Building at the University of Illinois was made by the writer[5] in collaboration with the supervising architect, Professor James M. White. This project involved the insulation of forty-five small practice rooms in the attic, twenty-one classrooms and studios on the first and second floors, and the large concert hall in the center of the building. The soundproofing features adopted are such as would be needed in any building where control of sound is desired so that a description of the details will be applicable to the case of a hospital.

The framework of the Smith Music Building was constructed of reinforced concrete, thus giving a massive, rigid structure not easily affected by vibrations. Each room was treated as a unit and separated as effectively as possible from the building structure by air spaces, sound-absorbing materials and sand. According to this construction, a sound experiences difficulty in escaping from a room and, before entering another room, must penetrate a second similar insulation. Figs. 5 and 6 picture some of the details.

## Greater Insulation for Music

Double partitions with a separating air space in which sound absorbing material was placed

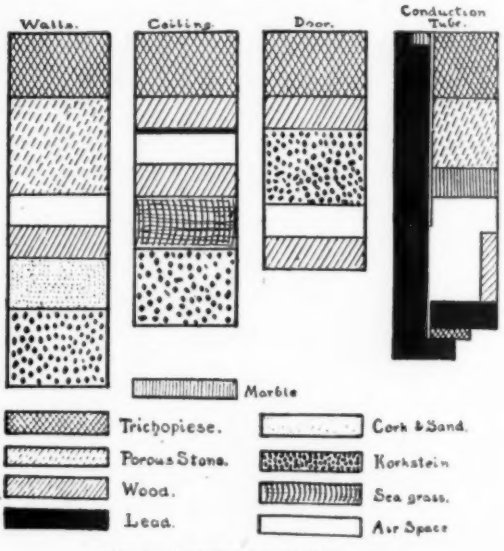



Fig. 2.—Details of noiseless room.

appeared quite effective in the insulation. Solid metal lath and plaster partitions, with air space, also appear promising for such constructions.[6]

5. "Soundproofing a Building," Architectural Forum, Vol. 35, pp. 178-182, 1921.
6. Architectural Forum, Vol. 32, pp. 249-252, 1920.

The effectiveness of these double walls was shown in several ways in the Smith Building. An observer speaking in a loud voice in a practice room with the door shut could scarcely be heard in the corridor outside. Music, however, penetrated the insulation more easily, although it was greatly diminished in the transmission. Students in practice rooms say that they do not notice sounds from other rooms except when they stop playing. The rooms are thus not absolutely soundproof but for practical purposes it appears that they need not be. Another evidence of the desirability of double walls was shown by a lecture room which was designed for speaking only, and was not soundproofed; the walls being single and the entrances equipped with ordinary doors instead of the soundproof type used on other rooms. When music was produced in this room, the leakage of sound into the corridor was more marked than for other rooms.

The floors of rooms were insulated from the building structure by sand and insulite (a ground spruce wood board). This served to minimize the transfer of vibrations of pianos which, because of their weight, made an intimate contact with the floor. Such a floating floor is comparable with a double-walled partition, the insulation in this case being between a room and a second room underneath.

## Sound Leakage Through Ventilation

A marked leakage of sound took place through the ventilation pipes. In spite of four separate ventilation systems and individual pipes to each room for inlet and exit of air, a transmission of sound was evident. Special arrangement of the vents is now being made with promise of minimizing this trouble. One method of avoiding leakage of sound through ventilators would be to secure individual air supply for each room, as, for instance, by drawing air from the outside through a special opening, warming it when necessary by a radiator, and thus avoiding pipes that connect different rooms.

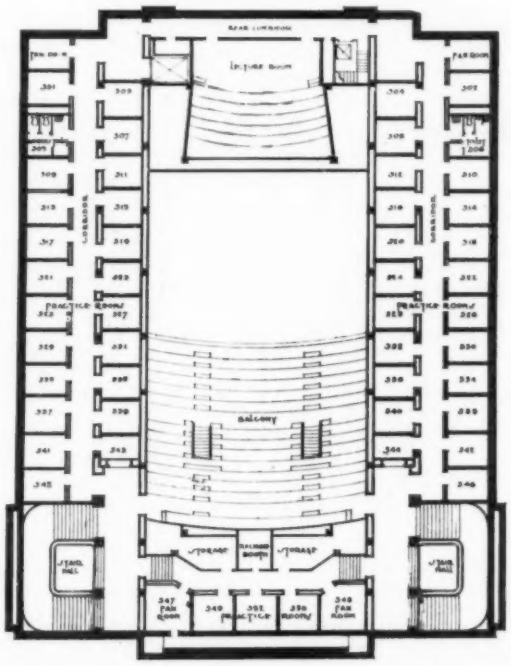


Fig. 4.—Attic plan of the Smith Music Building.

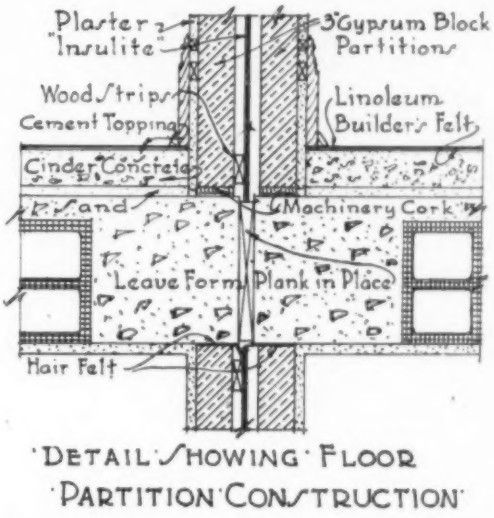



Fig. 5.—Detail showing floor and partition construction.

Some mention should be made of the arrangement of radiator pipes and electric conduits. These were all carried in outside or corridor walls so as to leave the walls, ceilings and floor between adjacent rooms entirely unbroken. A continuous wall is acoustically more effective than one with openings cut through. Doors, windows and ventilators were also confined to the corridor and outside walls. Ventilation fans and motors were selected to be as noiseless as possible and were housed in separate rooms.

## Hospital Machinery in Basement

Turning now to the problem of soundproofing a hospital, a number of additional features may be mentioned. All machinery should be placed in the basement, if possible, and mounted on heavy footings. The vibrations from especially heavy machinery could be insulated from the surrounding structure by using a separate base floated on crushed rock and separated from the surrounding flooring by a small gap filled in with asphaltum. Where it is necessary to mount machinery in the upper parts of the building, insulation from the structure may be secured by a construction of flax, felt, etc., which is bolted in a special way. (See Fig. 7.)

Elevators should be made as noiseless and free from vibrations as possible. Hydraulic elevators in this respect appear to have desirable qualities.

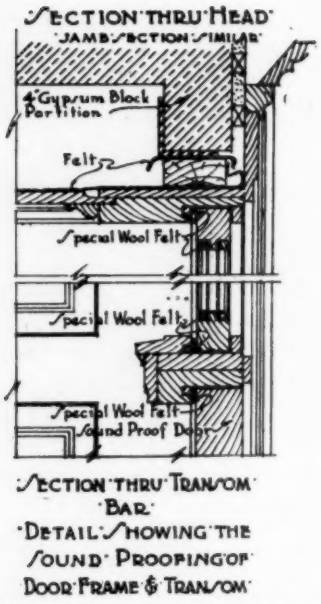



Fig. 6.—Section through door head and transom bar.

The elevator shaft should not be located next to rooms for patients but preferably surrounded by corridors and rooms where noise is not a disturbing factor.

Corridors and stair halls should be equipped with cork, linoleum or mastic floors to minimize sounds of footsteps and with padded ceilings to reduce other noises. A consideration of the quietness of hotel corridors is instructive in this connection. The heavy carpet not only deadens footsteps but absorbs other sounds as well. Carpets are unsuited for hospitals because of difficulty in keeping them clean. The objection to padding because it collects dirt and organisms is practically overcome by the use of a thin cloth covering. To this cover is applied a patented, rubber-like paint that gives a continuous, air-tight surface which prevents easy passage of organisms, but which, because of its extreme flexibility, transmits the sound waves to the absorbing padding with but little reduction.

## Soundproof Doors Are Essential

Wards and private rooms may be quieted by the use of two-inch hairfelt applied to the ceilings and covered with the sanitary painted membrane already described. Soundproof doors may also be used with good effect.

Soundproof doors appear quite essential in securing quiet conditions and efficient sound insulation. The door should close all the cracks when shut, including the threshold aperture. The patent Hamlin door has many desirable qualities for this purpose. To close the door properly, it is necessary to push the door handle with some force. Failure to do this results in an escape of sound. An automatic closing device appears quite desirable.

Special study should be given to the location of rooms where disturbing sounds are generated. Kitchens and serving rooms should be considered in this connection; also maternity and children's wards. Soundproof doors and padded ceilings in these rooms will help in the reduction of noise.

The disturbances due to street traffic may be reduced by the use of wood block pavement to deaden sounds of vehicles and horses. A subpavement of crushed rock under the blocks will serve to minimize the transfer of ground vibrations set up by heavy trucks or street-cars. These street disturbances are quite marked in some hospitals, so that serious attention to this phase of the project should be given in the construction of new hospitals.

Consideration should also be given to the noises created by water pipes. Toilets equipped with tanks are less noisy than those in which the flush water enters with considerable velocity through a valve. High water pressure is likely to create disturbing sounds. Soil pipes and other drains should be surrounded by suitable padding to prevent escape of sound and also to insulate them from the building structure.

## Construction of Floating Floors

Double floors may also be used. It is necessary to "float" the floor by a layer of felt, flax, etc., which should constitute a complete break in solid

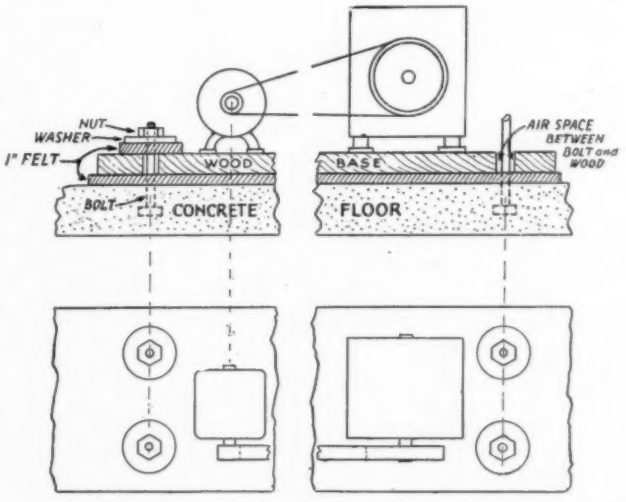



Fig. 7.—Diagram of construction for attaching machine footings to building structure so as to minimize vibrations.

materials. Nailing through this layer to the structure underneath practically nullifies its insulation. The felt may be laid between the structural floor and the sleepers to which the rough or finish floor is nailed. The addition of loose cinders or ground cork between the sleepers assists in the insulation. The floated floor should be quite rigid in construction, otherwise, adjoining boards in the finish floor will move slightly

with respect to each other and give rise to annoying squeaks. If the building has a concrete structure the floors may be insulated as shown in Fig. 5. In some respects, floating floors do not seem necessary for a hospital. The prevailing sounds are not those of music due to pianos or other instruments as in a music building where a discontinuity in the floor appears necessary but consist for the most part of the sound of voices of doctors and patients. A concrete floor of some rigidity would reflect these sounds quite effectively and would have the desirable quality of cleanliness. Where pianos are installed, they could be insulated by padded feet and by rugs. Rubber tired trucks and rubber heeled shoes would assist in the reduction of sound.

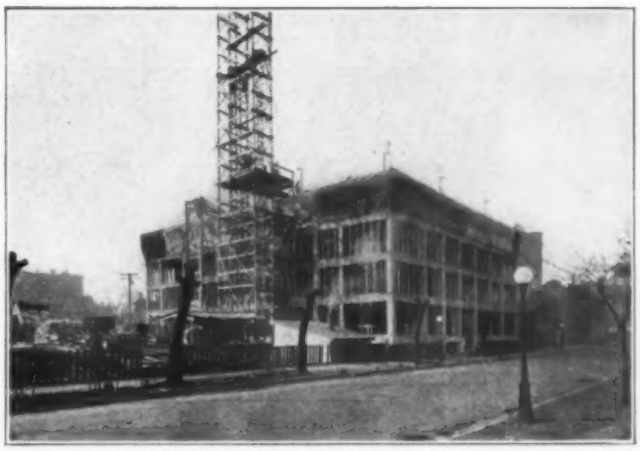
The considerations in the preceding discussion set forth some of the essential features of soundproofing that are suggested by the theory and supported by practice. Attention to the details enumerated should give an insulation resulting in a marked reduction of disturbing sounds. Absolute soundproofing can be obtained only with elaborate and unusual constructions, and does not appear necessary for ordinary hospital conditions because a small leakage of sound is not objectionable. One or two rooms with more elaborate insulation should be available for critical cases. Success in sound insulation cannot be predicted at the present time with certainty, but an observance of precautions in building with a proper record of results should develop in the near future a fund of information for reliable guidance in such matters that should insure satisfactory results.

## HOSPITAL SERVICE IN RURAL MISSOURI

The uneven distribution of hospitals in his own state pointed out by Dr. Guy L. Noyes of Columbia in an article on "Hospital and Medical Service in Rural Missouri," published in a recent issue of the Missouri State Medical Journal, without a doubt finds its counterpart in many other states. In Missouri, according to Dr. Noyes, sixty per cent of the population has access to only eleven per cent of the hospital beds. In St. Louis, Kansas City and St. Joseph the ratio of hospital beds to population is much above the average for the United States, but these three cities contain eighty-nine per cent of all the hospitals in the state. Three-fourths of the counties in the state have no hospitals at all.

"We have in the state approximately 8,000 beds," writes Dr. Noyes, "none of which may be done away with. Moreover it is obvious that we cannot bring about a redistribution of the beds that are already established. Nothing remains but to erect new hospitals where they are most needed. The situation in Missouri is particularly favorable for the organization of county public hospitals. There has been given to every county the legal right to build and maintain a general hospital.

"I would place a public hospital in every county—in some counties more than one—and by that means be able to give assurance to the recent graduate in medicine



A construction photograph of the new nurses' home for Augustana Hospital in Chicago. The building is to be eight stories in height, the fifth floor being the one under construction when this picture was taken in February. Meyer J. Sturm, Chicago, is architect.

trained in the hospital wards and laboratories that he may go to the country to practice without relinquishing in any degree his ideals as to the quality of service he should render. I have no sympathy with the proposal to supply a group of substandard or poorly trained medical men on the theory that they will in their unpreparedness seek the seclusion of the countryside and after all be 'good enough doctors for the country.'

"I would so organize and equip county hospitals as to assure the young physician that his individual expectations as a medical practitioner need suffer no setback by reason of his residence in the country. I would assure him, further, of an alert and competent hospital and staff companionship. I would dedicate every county public hospital to the proposition that every man, woman and child is entitled to health. I would make every county public hospital a health center in truth and proceed upon the assumption that of the people it is to serve some are born healthy, some acquire health and that some must of necessity have health thrust upon them. Large and expensive hospitals are not necessary. Complete equipment for purposes of diagnosis and treatment is indispensable and yet easily obtainable by a county community.

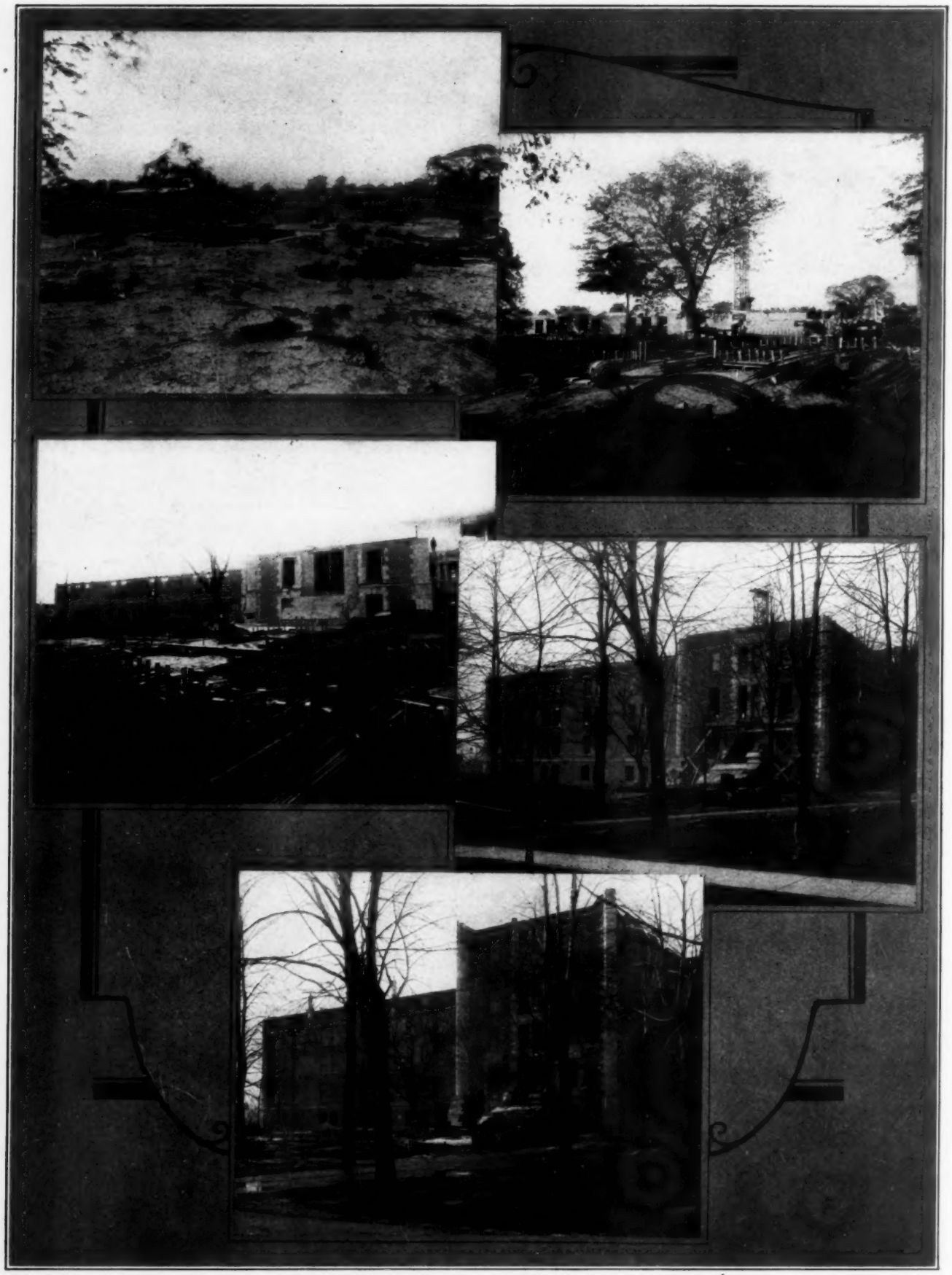
"County hospitals with proper libraries, laboratories and equipment will encourage young medical men to come to us in the country. With hospitals such as are needed located in the county we shall again have significant contributions from medical literature as a result of observation of country doctors. And moreover we shall see a reduction in the rural death rate which has been constantly ascending during the past twenty years in spite of the fact that the city death rate has not been increasing.

"Such agencies as the state board of health and the state medical association should perfect an arrangement by means of which they may give authentic and useful information to any community seeking advice regarding the building and maintenance of a public hospital."

## SALVATION ARMY HOSPITAL IN CHICAGO

A maternity hospital and home for girls is to be built by the Salvation Army on the far north side of Chicago. The hospital and home will be erected on a seven-acre site at the approximate cost of $150,000. Plans have been drawn by Richard E. Schmidt, Garden and Martin of Chicago, and construction will start in April. The hospital and home will care for Salvation Army cases throughout the state.

## PROGRESS PHOTOGRAPHS OF THE SAGINAW (MICH.) GENERAL HOSPITAL



**Upper left picture taken August 4, 1921; upper right, October 1, 1921; middle left, November 1, 1921; middle right, January 1, 1922; lower, February 1, 1922.**

# THE RELATION OF COST OF CONSTRUCTION TO COST OF MAINTENANCE

By MEYER J. STURM, Hospital Architect, Chicago

SO MUCH that has been written on the cost of hospitals has unfortunately been based on the cost per bed that the writer of this article attempts with some trepidation to make an analysis of the relation of cost of construction to cost of maintenance. It becomes necessary, therefore, to emphasize first the principle that from an ethical standpoint authorities and architects must be absolutely honest and sincere.

*"Hospital building committees unfortunately have a rudimentary idea as to the relationship between ideals and cost. No doubt this is most unhappily true of architects. Both the unsophisticated client and the uninformed architect begin by wanting everything, and then when contractors, material men and members of trade unions are through there is bitter disappointment. Immediately begins a drastic application of false economies, scrimping, playing of cheaters against each other, and the acceptance of second rate contractors with the result that the completed building has not only cost infinitely more than it should but also has a maintenance cost that mounts higher each year."*

Avowedly such a premise must rest largely on the conscience of those who are building, as in this class of construction the public must be safeguarded in every possible manner, especially so in the distribution of the money which is usually contributed by this same public.

Unfortunately the planning of hospitals has been left too largely in the hands of those who, by the selection of their architect, have shown a woeful lack of honesty and sincerity. This very attitude of mind bears a most vital relation to the cost of construction as affecting the cost of maintenance. Manifestly a hospital that is badly planned will cost more to maintain than one properly planned, requiring the minimum amount of travel and work in its maintenance.

## Must Not Standardize Plans

There is no logical manner in which one could standardize the plan of a hospital so as to minimize this cost of maintenance. As a matter of fact so far as the planning of a hospital is concerned there is no possibility of standardization, and fortunately so, because if a standardized plan were once introduced and adhered to all progress in hospital building would be impeded. There is no great danger, however, of such an occurrence; we mention it solely to preclude the probability of a misunderstanding of the much mooted, discussed and abused use of the word "standardization." Equipment in construction and ordinary equipment can and should be standardized. This is also true of much of the routine.

A plea might here be made with propriety for architects who have made a study of this class of building and a word of praise be given to them and others who have done so much in the planning of institutions wherein the cost of construction, though always kept within reasonable bounds, has been secondary to the service to be rendered.

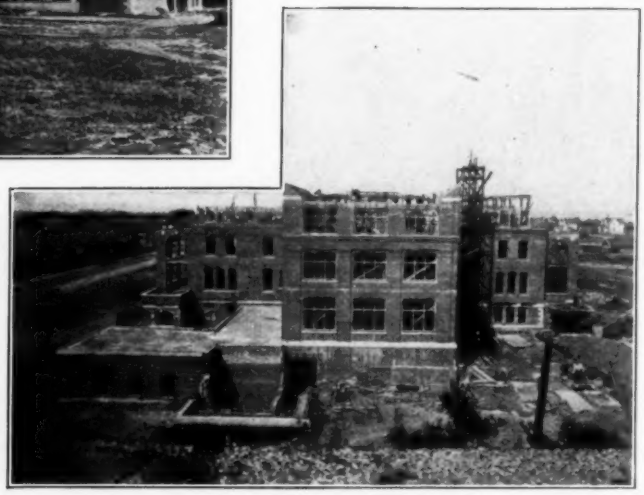
As to the physical aspect of this analysis, namely, concrete examples of essentials to minimize the cost of maintenance and justify the increased expenditure, a paramount consideration, and one taken for granted, is that the hospital has been properly planned; that is to say, all the service and administrative departments are so located that they will necessitate the least effort and the fewest possible steps for care of the patients. With this in mind, we can briefly consider some phases of construction and equipment.

## Economy in Apparatus

In the planning and installation of the plumbing, heating, and electric work there should be no false economies. Without any exception, the planning of these vital adjuncts should be done with the utmost care by an architect who is thoroughly conversant with every requirement of an efficient installation. The lack of proper facilities for these three branches, their infinite variations, their proper installation and operation, are the most prolific sources of excess cost of maintenance.

We may well consider the operation of electric elevators and dumbwaiters in the ordinary institution. When of the automatic type, these preclude the necessity of an operator. Operators mean either limited service or the necessity for having an operator on the elevator night and day. A cost of even $10 per week for each such operator would amount to the interest on $8,000 per annum. If such an example were carried to its logical conclusion in each item of possible equipment it could be readily shown that

the expenditure per year for maintenance would be increased to an appalling extent. On the other hand if by properly planned and installed equipment a like amount could be saved, there would be involved in the percentage of saving the equivalent of a capital sum far in excess of the original construction or equipment cost. It might be stated with all emphasis that this would be a yearly saving, and the initial expenditure would in reality be an asset and revenue producer to that extent. Only a lack of knowledge of essential requirements in equipment and construction or a lack of foresight on the part of those concerned could be responsible for a policy which would preclude this desired result.



Brandon General Hospital at Brandon, Manitoba, as it appeared on September 1, 1921 (below) and as it was on October 1, 1921 (above). Stevens & Lee of Boston and Toronto are the architects.

As has been pointed out frequently, the difference of one cent per day per patient in a 100 bed hospital would be equal to the interest at six per cent on $6,000 and it is not incredible to believe that it would be a very simple matter to save in the proper construction and equipment a minimum of ten cents per patient day which would be the interest on the same basis of calculation on $60,000 per annum. This sum would be acceptable as a very nice endowment for almost any 100 bed hospital. By the remodeling of service departments the writer has saved as much as 50 cents per patient per day over previous cost.

The difficulty seems to be that those interested in building hospitals are somewhat hypnotized by complicated apparatus and methods of construction, because promoters and material and equipment dealers promise service which will practically eliminate the human equation and prove itself foolproof. Men who bring forth such futile arguments to sell apparatus and material are easily detected by the initiated and should be discouraged as dishonest.

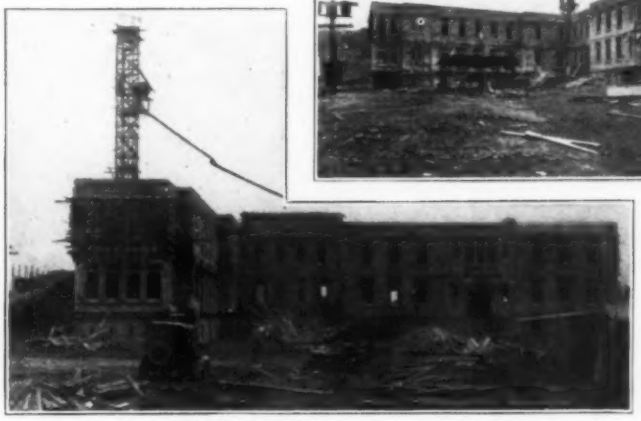
Let us consider, as an example, one of the greatest necessities in a hospital, the signal system for calling nurses. Practically a direct system can be installed which merely consists of an electric light over the door or bed or both, operated on the ordinary 110 volts by simply pulling the cord attached to a toggle switch at the head of the bed. In opposition to this simplicity there are all sorts of complicated apparatus with contraptions and extensions to the office of the superintendent so that he can keep check on the nurses. If the superintendent is "on his job," he most assuredly cannot be sitting in his office all hours of the day and night watching the signal system. That is not what the hospital authorities have employed him to do. Recently there have been installations of time clocks and stamps and other such apparatus, which have their specific uses in their place. Their place is not to keep "tabs" on the nurses and the rest of the help in the institution. No apparatus has been devised that will keep a dishonest or incompetent nurse, or any other employee, from "beating the clock." There is only one way to cure an evil of this kind, no amount of expensive and unnecessary apparatus will do it. This is merely an example of some of the items which make the cost of construction high and which in no way reduce the cost of maintenance, on the contrary, by their inevitable upkeep they increase maintenance costs. All sorts of such apparatus are "special" and can be replaced only by purchase from the maker. Here where it is feasible and of greatest benefit is a woeful lack of standardization.

Another concrete example might be given in the installation of a thoroughly equipped laundry.

While the cost of conducting such a laundry, the upkeep and maintenance of the machinery, the interest on the initial cost, and even a fair depreciation charge might be as great as if the laundry were sent out, still the time element enters largely as a matter of convenience. Laundry work "at home" invariably is less wearing on the linen than when it is sent out, and the amount saved on linen replacement would at least pay dividends. Instead of being a liability a properly planned and equipped laundry would be found to be on the other side of the ledger.

Many problems which involve the question of maintenance must necessarily arise in any institution. Occasionally it is necessary to increase the construction cost to correct certain conditions. It is infinitely better to take the "bull by the horns" and make necessary expenditures than to perpetuate a condition which by its prevalence has brought many hospitals into the limelight in an unenviable manner. The general public, while willing to contribute to the building of hospitals, is somewhat opposed to the high cost of hospital service and in many cases the seemingly unnecessary solicitation of funds for maintenance.

Hospitals in general have become popular but there is no reason why they should not become more so. The need at present is for more hospital service at a lower rate and this can only be obtained by having the cost of maintenance commensurate with the cost of service without the sacrifice of any essentials. If there was not such an insistent demand for lower cost hospital service, then there would be no need of reducing maintenance costs.



The San Mateo County Hospital building near Belmont in San Mateo County, Cal., in its present stage of development is shown in these two photographs. The completed structure will house 100 patients. William H. Toepke is the architect and R. G. Brodrick, consultant.

Some years ago one of the hospitals in the vicinity of Chicago had a maintenance cost of $5.25 per patient per day. At the same time the average for the United States was approximately $2.10 per patient day. When the situation had been thoroughly canvassed and analyzed it was suggested that it might be possible to make a saving of fifty to sixty cents per patient day provided the authorities would be willing to do certain remodeling, erect certain additions and put in necessary equipment at a total cost of about $100,000. This was to provide not only for the then existing institution of 100 beds, but was to be adequate for the maintenance and necessary facilities for a contagious disease wing of eighty beds, and a contemplated future addition of about 150 beds. Even with sufficiently extensive equipment to serve these two additional units fully, as is now being done, the authorities found at the end of the first year that the cost of maintenance had been reduced somewhat over $1.00 per patient day, which is the interest at six per cent on $600,000. In other words, it was conclusively proved that by the expenditure of $100,000 the hospital had not only provided for its future enlargement but it had what virtually amounted to an endowment equivalent to six times the amount of the expenditure and a clean slate at the end of the year instead of a deficit.

If such results can be obtained by additions to and changes in existing institutions it is not amiss to state that much more could be accomplished in institutions properly planned and equipped in the beginning.

## Relation of Ideals to Cost

In all probability the most prolific source of high maintenance cost is due to a lack of appreciation of the vital fact that there are only two methods by which a building can be erected. Either the size and extent of the institution must be planned in accordance with the amount of money available, or, there must be sufficient funds at hand, or obtainable, to carry out the wishes of the committee or community hon-


The proposed Isolation Hospital for the town of Greenfield, Mass., as planned by Kendall Taylor & Co., Boston, architects.

estly and conscientiously. This subject of the relation of the cost of construction to the cost of maintenance is after all in the final analysis merely the old economic problem of buying as much as possible for the amount of money that you have.

Building committees unfortunately have a rudimentary idea as to the relationship between ideals and cost. No doubt this is most unhappily true of many architects. Both the unsophisticated client and uninformed architect begin by wanting everything and then when contractors, material men, and members of trade unions are through there is bitter disappointment. Immediately there is a drastic cutting down and application of false economies, scrimping, the playing of cheaters against each other, and the acceptance of second-rate and doubtful contractors with the result that the completed building has not only cost infinitely more than it should have but also has a maintenance cost that mounts higher and higher each year.

### Sacrifice Necessity for a Fancy

Frequently committees and authorities of smaller hospitals when they are contemplating new or larger units want everything that they have seen in their futile junketing tours; very often they omit necessities in their insistence upon what they consider essentials. What would be essential in the average large hospital might be cumbersome, expensive, and absolutely unnecessary in the small hospital, although the latter with proper equipment might be doing the same class of work at the proportionate maintenance cost as the former. Fortunately a good hospital of any size, well planned, does not cost as much primarily as a badly planned hospital, and it must be evident that the maintenance cost would be considerably less in one properly, economically, and honestly built and equipped than one that has none of these essentials. This is as true of overplanned, fussy and expensive "show places" with extra equipment as of poorly planned institutions.

Cost of construction bears a direct relation to cost of maintenance in a hospital, in the same manner and for the same reason as it would in a factory or industrial plant. No sensible corporation, company, or individual would proceed to plan, build and equip a factory for any purpose in the manner that most of our hospitals are planned. It would be suicidal, as production cost would preclude marketing in competition, especially where the fraction of a cent is the difference between failure and success. A hospital has been designated as a workshop wherein human beings are mended and why not let it be then not only as perfect as it can be made, but let it be so planned and equipped that it may serve its purpose for rich and poor alike at a cost that makes it sought universally.

## COMMITTEES TO INSPECT A. H. A. EXHIBITS

To develop the exposition at the annual convention of the American Hospital Association into a real educational feature and an aid in professional efficiency in hospital administration, trustees of the association have asked President George O'Hanlon to appoint five committees. These committees will represent building, general furnishings and supplies, clinical and scientific equipment and supplies, food and equipment for food service, and laundry equipment and supplies.

The duties and the instructions of these committees will be: (a) To be active in the selection of firms to be invited, to the end that the exhibits in their line shall present an exposition of all the very latest and most desirable items obtainable. (b) To combine the exhibits of two or more items of equipment or supplies whenever a combination is more instructive. Space will be arranged for this. (c) To inspect carefully and critically every exhibit in their field. (d) To report to a general session of the convention (not later than the second day) upon the exhibits in their respective fields, setting forth that which can and should be seen by delegates to the conference and expressing opinions of the committee or collected opinions in regard to important policies and principles in the selection and purchase of equipment and supplies.

## DR. WILSON IS TREASURER OF A. H. A.

Dr. Robert J. Wilson, director of hospitals for the New York Department of Health, is the new treasurer of the American Hospital Association. Dr. Wilson succeeds Mr. Asa S. Bacon, president-elect, who resigned, as was suggested by the nominating committee, when he became ex-officio member of the board. Mr. Bacon's resignation was accepted by the trustees in a resolution expressing their appreciation of his services and their hope that he will again serve as treasurer after his duties of president have been finished.

## DR. WINFORD H. SMITH GETS D.S.M.

The Distinguished Service Medal has recently been awarded Dr. Winford H. Smith, superintendent of Johns Hopkins Hospital at Baltimore, for services rendered during the war. Dr. Smith is credited with bringing many ideas to the office of the surgeon general which aided in the administration of the Medical Corps.

# THE SMALL COMMUNITY HOSPITAL

By OLOF Z. CERVIN of Cervin and Horn, Architects, Rock Island, Ill.

HOSPITAL trustees faced with the problem of providing a new building will have many things to consider. If it is fortunate enough to have conducted a small hospital, even though it was only maintained in some former residence, it will have the advantage of its own experience and of valuable suggestions from superintendent and doctors.

The first question in a consideration of construction is how many beds should be provided for patients. A rough and ready rule has been evolved based on population which gives one bed to each 150 persons. This estimate should be based not only on the city population but on that of outlying small towns and the surrounding country. Just how much should be allowed for future growth will have to be determined after careful consideration of present conditions and prospects for industrial development.

## To Determine Its Size

The character of the territory surrounding the proposed hospital will have a bearing on its size and equipment. If isolated and the distance to large centers where specialized hospital service can be had is great, it will be advisable to provide a hospital with many departments to serve all needs. Another factor is the nature of the prevailing business. Is it agricultural, commercial, industrial, or mining? If industry or mining prevails, more attention must be paid to surgery, and plans should include several operating rooms, one for emergency purposes. Wealth is a third factor to be considered. It is evident there will be more calls for private rooms and baths where the wealth is great than in a community consisting mostly of factory workers and laboring men.

After obtaining all possible data the board should determine how much of the hospital should be devoted to wards and private rooms, how much to medical cases, to surgery, to children, to a maternity department with delivery, labor and crib rooms, and to x-ray and other laboratories. It should be clear that it is better to permit nearby hospitals that are already well equipped to take care of certain of the above departments than to make an inadequate attempt to provide special services.

The location of the hospital in the city will have much to do with its popularity. To be well patronized it is necessary that it be accessible and reasonably near the center of activities and yet away from disturbing noises and odors. It should be on or near a car line. The ground should be high, airy and well drained and if there are trees so much the better for shade and coolness; the buildings look well when set off with rich foliage. Of course there must be access to public utilities, such as sewer, water, gas, and electricity unless a considerable sum is set aside to build independent plants. In these days of automobiles, the streets surrounding the hospital and leading to the city center must be paved, preferably with asphalt. In most cases a site should be selected which will allow the hospital to expand in the future even though the present outlook may not indicate growth.

## A Consideration of Cost

After determining the number of beds and size, cost is the next consideration. Hospitals like everything else have had great variation in cost. Before the war it was safe to assume twenty-five to thirty cents a cubic foot for a fireproof structure. At the armistice it was about fifty cents, and at the peak (summer of 1920) it was approximately seventy cents. Present prices run from fifty to sixty cents according to grade and completeness. Few architects or builders look for lower prices for years to come.

The building may take any one of three well defined shapes, the simplest of which would be represented by the letter "I," a long rectangle, extending from north to south so as to give the best light to all rooms. Another shape would be represented by the letter "L," which while not quite so easy to arrange for sunlight in all rooms will be found to lend itself better to an attractive exterior appearance, especially on a corner lot. Many hospitals are built "U" shaped but these are larger and a fifty bed hospital would rarely be planned on this type, nor on the "H" and "X" plan, the latter two being especially adapted to larger institutions. But whatever the shape the building should be non-combustible, as near fire and smokeproof as possible.

It is quite likely that the hospital we have in mind will be erected rather distant from other buildings, and these of ordinary height. It should, therefore, be kept low, certainly not over two stories and basement in height unless in a downtown district where a site is expensive. It is difficult for even an experienced designer to make a small three-story and basement isolated building look attractive, especially a hospital building which should have the least possible of the institutional look about it. An interesting and practical though expensive plan is to arrange the oper-

ating suite in an upper and separate story, open on all sides and free from disturbance. It helps the appearance of the exterior. If there is a good slope of the ground, by all means it should be utilized to make the basement nearly as desirable as the main floor as far as light is concerned, excepting for a few rooms on the high part of the ground.

## Centralization a Big Factor

In considering the details of interior arrangement three important factors demand attention. First, there should be centralization to allow for economy in the daily work that will have to be done. A few unnecessary steps each day multiplied by eight or ten people and then by 365 days for the year will make a serious sum total of miles. The stairs, the elevator, and ambulance entrance near it, the office, the nurses' station, the utility and the diet kitchens should be grouped as near as possible about the center of the building to allow quick communication. Although it is not so important and often quite difficult to segregate the various classes of patients in a small hospital, something should be done to accomplish this desirable object. Wards should be kept as far as possible from high priced private rooms. The children's and maternity department should be separated from the others, and of course the operating suite with its many rooms should be as sequestered as possible. If a ward is provided for children, it would be well to include a separate balcony or porch.

A third point in planning is a consideration of emergency periods when the hospital is taxed to its capacity and beyond. Some hospitals which have been planned for sixty beds have been so arranged that they have taken care of eighty without undue crowding. This can be accomplished by providing large solariums (which should always be a part of a hospital, since no

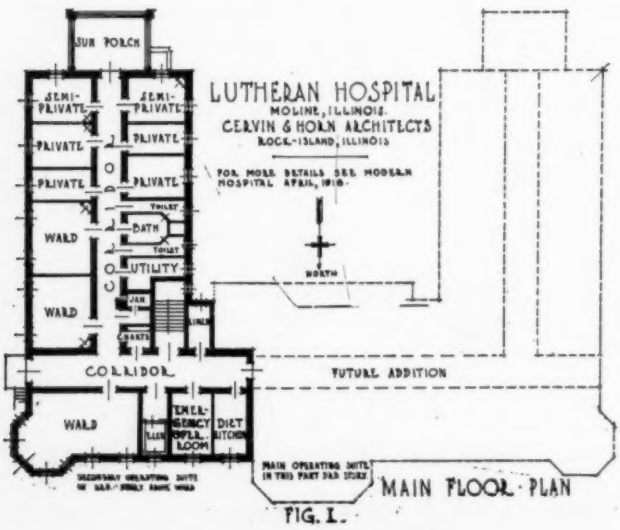


FIG. I.

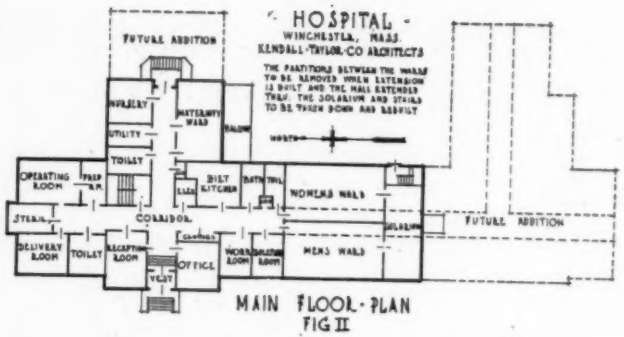


FIG II

factor is more appreciated by patients), so arranged that they can be used as wards. Some private rooms should be of such a size that in an emergency two patients can be placed in a room designed for one. Although wards should be small, not more than four or six beds at most, these can also be so arranged that one or more beds may be added. It has also been found possible to use the end of halls by closing off with temporary curtains, screens, or partitions with doors made of light materials, such as wall board. It is, of course, well to provide call buttons for these emergency needs, electric lights and proper ventilation.

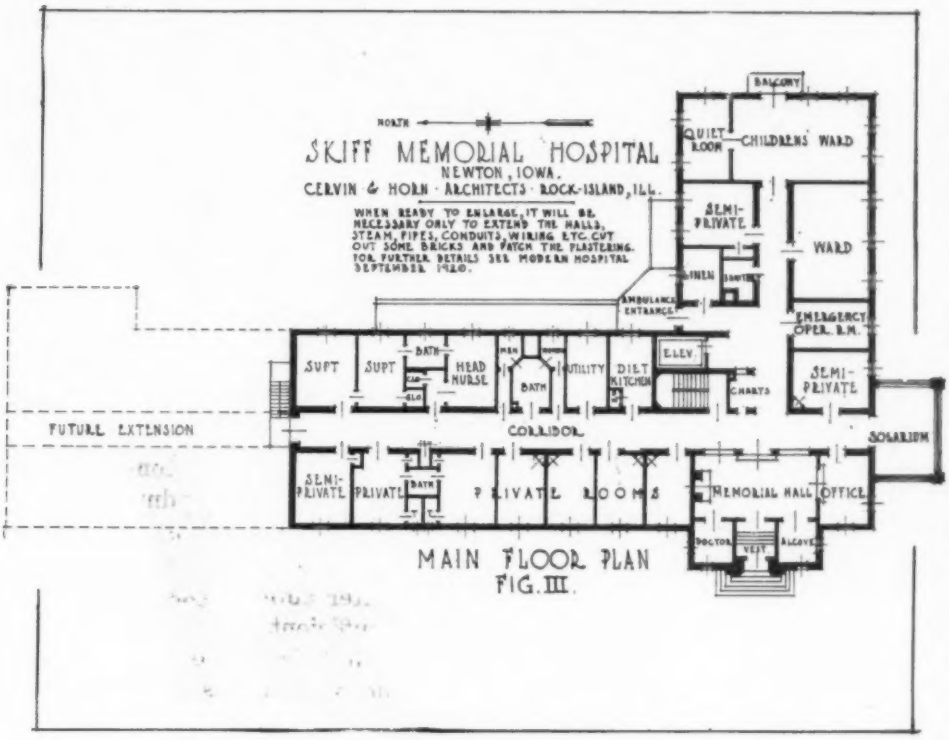
A point often discussed and still oftener overlooked or neglected is that of extensions to take care of future growth. It must be admitted that it adds to the immediate cost to plan for the future, since it is necessary to provide capacities of the heating plant, water supply, gas, electricity, storage and offices sufficient to take care of a larger plant. It is also desirable to provide more hall space than would be otherwise necessary, so the corridors can be continued without alteration of rooms. Nor is it easy to design a building that will look complete and yet allow for extension without marring the present lines. Nevertheless, in most cases none of these objections should prevail against planning for the future.

## Planning for the Future

There are at least four ways of taking care of the future.

The first was adopted by the Lutheran Hospital in Moline, Ill., and is shown in Fig. I. The entire building was planned, and then one section built as shown, it being arranged so as to involve a minimum of remodeling to complete the structure. An old residence is now used for kitchen and administration purposes and to accommodate some of the nurses. It is connected with the new building by a bridge; the new structure is thoroughly protected with automatic fire doors and fire walls against the hazard of the frame residence. Notes on the plan indicate operating arrangement.

A second method is illustrated with outline



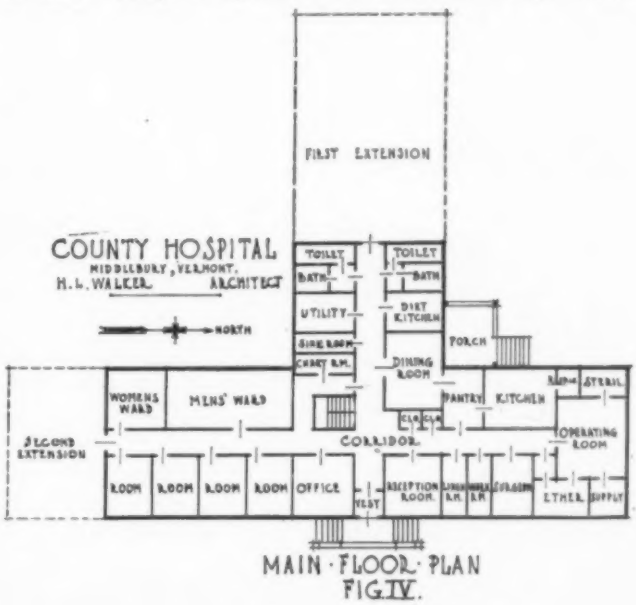

plan of the hospital at Winchester, Mass., (Fig. II). The architects of this building plan that when the extension is built to the south the partition between the men's and women's ward will be removed and the corridor lengthened. Addition can also be made to the east, as shown by the dotted lines. The stairways are so built that they can be taken apart and re-erected. It is well so to plan that extensions can be built with the least possible disturbance of the interior. This is done in the Skiff Memorial Hospital at Newton, Iowa, (Fig. III), where it will be necessary only to take down and re-erect the fire escape. A community hospital at Middlebury, Vt., illustrates the same point, with a possibility of extension in two directions (Fig. IV). Note how the halls are planned to run through to the end of the present building in the latter two hospitals.

A third manner of providing future additions is illustrated by a typical twenty bed hospital. (Fig. V.) The design of this plan is similar to those already described but two more additions can just as well be made as suggested by the writer of this article, permitting the present sun porches to remain as connecting porches. This plan is the pavilion type. It lends itself very well to exterior treatment.

More often used for larger institutions is a fourth method, a plan of entirely independent buildings with or without covered passages. Underground connections through tunnels, of course, are highly desirable to take care of steam, water, gas, and electric pipes as well as to provide communications between the basements. This is illustrated by Fig. VI, a hospital group planned on the pavilion system and suggested by the writer as typical. The order in which the buildings would be erected is indicated by numbers. Such a plan would be desirable where land is plentiful and the climate is warm.

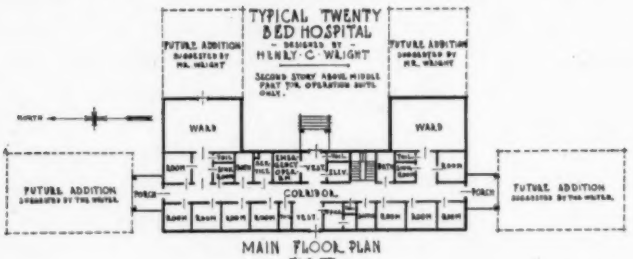
How complete in its departments the community hospital shall be, that is, if any community hospital can be complete, will have to be determined by the individual circumstances. The word completeness is often used in too loose a manner, for, like perfection, completeness can only be approximated. Even the most highly specialized hospital, richly endowed, will find that there is room for improvement and additions.

First there will have to be a kitchen with the best apparatus for refrigeration the purse will allow, together with convenient storage rooms. The need of the kitchen no one questions. There will, however, be some difference of opinion as to the need of a laundry. The experience of most superintendents would strongly favor a mechanical laundry equipment, though it be small, with drying and ironing facilities. The public laundry is seldom satisfactory and in the long run expensive, although it must be admitted that it is also costly to operate a private laundry. Nor



is it always possible to get hospital work done in a commercial laundry; few cater to this kind of work.

Whether an isolation department shall be included or not will have to be considered. At times it is necessary to isolate at least for a period of observation. In these days of prohibition the use of the isolation room for D. T. patients is



MAIN FLOOR PLAN
FIG. V

becoming rare. The objections to having any case in the hospital of a contagious nature are many, but unless special buildings are provided in some other place, it would seem cruel to have no provision for such emergencies. If determined upon, an isolation department should have an outside entrance and should be as complete as possible, so as to be independent of the rest of the hospital. On the subject one experienced superintendent writes:

"In most communities there is an occasional outbreak of contagion, or at any rate there are usually a few such cases to be found. There is no better place for the care of these cases than the hospital, for it is through the means of careful isolation that the disease may be held under control and an epidemic averted. In an isolation department, walls should have a durable finish of enamel which will permit thorough cleansing by the use of strong disinfectants. Special attention should be given to the elimination of as much piping and unnecessary fixtures as possible."

## Accommodation of Nurses

Some community hospitals provide a dispensary or an out-patient department, and no doubt this is a step in the right direction. There should be a separate entrance to this department, so that the regular patients may not be disturbed.

Nurses are occasionally housed under the same roof with the patients, and in planning accommodation it will be necessary to provide a suite for the superintendent and a commodious room for the head nurse. A bathroom may possibly be used in common. Besides the regular nurses, accommodations in the most quiet part of the hospital must be provided for the night nurses. Another room should accommodate the outside nurse as a place for rest and change of costume. A separate nurses' home is much to be preferred, so that these faithful workers will have a change of atmosphere when off duty.

As to the hospital help, opinion varies on whether they should be housed in the hospital. The tendency seems to be more and more to provide inside accommodation, since it conduces to regularity of hours. Rooms with toilet facilities should be arranged for the cook, women help, and the janitor. If the basement is high and dry and the windows are of good height, these rooms can be arranged there.

## The Consulting Architect

A board which fully realizes the necessity of careful consideration of the subjects above mentioned will no doubt be glad to avail itself of the best talent that can be found for consultation and to arrive at definite conclusions before plans are made. If an architect, experienced in hospital work, cannot be obtained, it will be necessary to depend upon the hospital superintendent and the local doctors. They will have many good ideas but will very likely not be able to interpret them and still less to express them with lines on paper. It is now possible to secure the services of consulting architects of wide experience, and of hospital consultants who have developed from practicing doctors into this specialized field.

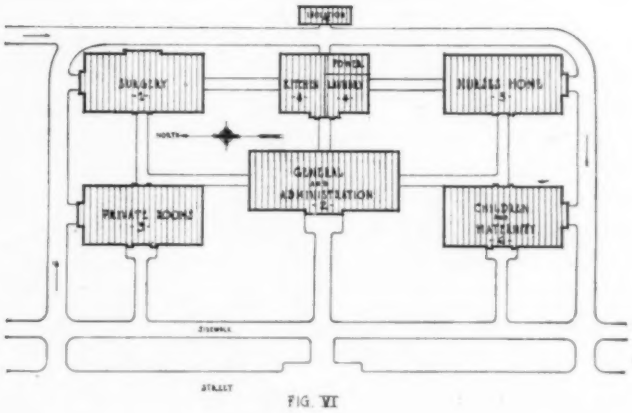


FIG. VI

If sufficient grounds surround the building, it is to be hoped that a skillful landscape architect will be called in to improve the natural setting. If the architect and landscape gardener may be given opportunity to work together from the beginning the results will be infinitely more satisfactory.

A later article will go into some of the details of the small community hospital building and its arrangement.

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"Skill enables a man to deal with the same circumstance that he has met before; scientific thought enables him to deal with different circumstances that he has never met before."—Dewey.

# THE ADMINISTRATOR'S PART IN HOSPITAL PLANNING

By A. L. BOWEN, Former Superintendent of State Charitable Institutions, Department of Public Welfare of Illinois, Springfield, Ill.

*On the grounds of a state hospital one can find as many architectural strata as there have been political architects since its establishment, says Mr. A. L. Bowen. He does not attach the blame to the architect but rather holds guilty the superintendent for the "gloom and misery prevailing in the architectural motifs of state hospitals."*

*"The gregarious instinct among state hospital administrators eradicates slowly," Mr. Brown remarks. He recalls the old superintendent, who, trying to operate a cottage institution from his swivel chair, was bemoaning the evils of the day which separated him from the old hospital in which he could "visit any ward in his stocking feet."*

HOSPITAL buildings twenty-five and thirty years ago "just grew." They remain with us today and are occupied because they are too good physically to dismantle but are very far out of date. When they were planned neither architect nor superintendent understood what was needed.

The hospitals built today are, for the most part, the embodiment of the ideas of the architect. Architecture has developed a specialty—that of hospital planning and building. Hospital administration and management have not yet taken the serious part in the development of hospital planning that they should take.

The hospital of the future will be the joint product of architect and administrator. Architecture has done its part. It has developed the specialty, as I have indicated, and is studying all the problems it has to deal with. It has even gone into the field of professional management because there has been such a dearth of administrators with a knowledge of what should be incorporated in new construction. The architect has given to the modern hospital its exterior style; he has economized on space within; he has shortened distances and installed equipment and devices that are labor-saving. The architect has reached the limit of his possibilities in hospital construction, unless we are to expect him to qualify as an expert in administration.

Hospital improvements of the future will depend, I believe, upon the hospital administrator. As a profession, hospital management is just emerging upon the scene. By cooperation with specialized architecture it can give us a better hospital than any we now have.

## Professional Hospital Knowledge Rare

The absence of professional hospital knowledge is most clearly apparent in the state and federal service where administration as a profession is an almost unknown quantity.

The architect, called upon to plan a new state hospital for mental and nervous cases, for instance, is almost at sea. Even those who have specialized in general hospitals strike a new field and have to guide them only what someone before them has done.

For many years superintendents and boards in charge of these particular institutions have changed so often and have been subject to such political domination that little knowledge in the planning of new institutions or in developing the old has accumulated. The newest state hospitals are not enough of an improvement, from an architectural standpoint, over the old types to warrant any enthusiasm about them and even less improvement may be noted from an administration standpoint. The congregate institution has been discarded and cottages substituted, but the big unit still remains. An institution of three-story cottages, housing 150 insane patients each, is little better than the old style congregate institution.

I once traveled through nine northern states seeking new buildings at state hospitals or other state eleemosynary institutions. I wanted to get the latest ideas. Illinois was preparing to spend a large sum upon enlargements of old institutions and the erection of a new hospital. My trip was almost fruitless. I found very few superintendents who had given the subject much thought. Even the oldest and most experienced were not builders and left all such subjects to the state architect. They frankly told me they had no improvements to suggest and always left planning entirely to the architect. The result was that gloom and misery were still the prevailing architectural motifs of state hospitals. It could not be otherwise; architects followed what they saw, thinking of course, it was right.

The state architect, as a rule, is a short term political appointee. He wants to do something different from his predecessor. Hence I found on the grounds of these institutions as many architectural strata as there had been political architects since their origin.

Having little or nothing to work on and being determined to do something that none of his pre-

decessors has done, the architect with a commission to plan a building or institution is very likely to be guided by preconceived notions, by what he sees or by a very superficial knowledge gained by a brief experience.

An example will be timely.

Such a political architect fell heir to the job of building a new hospital for the insane. Until a few months before he started the task, he had not seen an institution of its character but he soon acquired ideas. Unfortunately his first advisers believed in an institution "all under one roof." Then again he had a lot of notions, hastily conceived out of what he had seen on several trips to state hospitals of the old type.

The congregate hospital is the ideal hospital for the employe. It suits the average superintendent and his staff and everybody else on the payroll. It is easier to manage and handle and requires less thinking. An old superintendent who was trying to operate a cottage institution from his swivel chair was bemoaning the evils of the day which had separated him from the old institution in which he boasted he "could visit any ward in his stocking feet."

It was such an adviser who put this architect up to drawing a freak institution, the object of which was to pack as many insane into as small quarters within the shortest distance of headquarters as was architecturally possible and "all under one roof." The gregarious instinct among state hospital administrators eradicates slowly.

## Freak State Institutions

Final approval of his plans depended upon several men who had modern ideas as to the rights of the inmate himself. After long, heated discussion, they were withdrawn in favor of a pure cottage institution with plenty of room for recreation and the ordinary activities in which the physical man finds enjoyment, no matter how seriously he may be afflicted mentally.

This artistic building has been designed for the hospital at Milton, Mass., by Kendall Taylor & Co., architects.

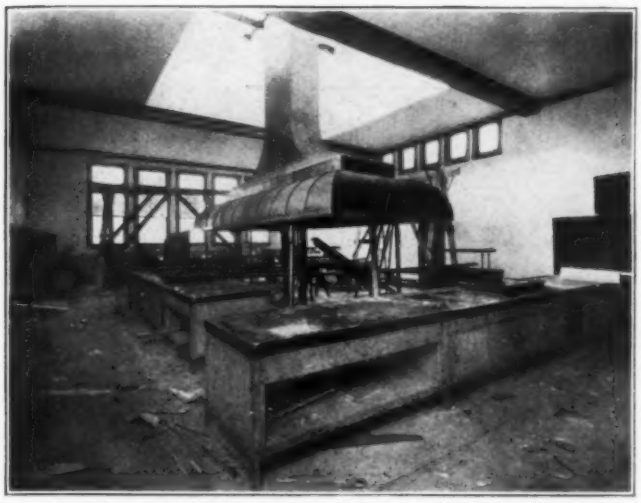
Another architect of very much the same type came to me one day with a wonderful discovery. "I don't like the 'T. B.' cottages that have been erected at the state hospitals, and I have devised one that ought to be an improvement. They tell me that the tuberculous ought to have plenty of sunshine, so I have planned a cottage to be made like a green house,—all glass." He was very much disappointed when he heard my objections and realized he could not build greenhouses to house tuberculosis patients.

These men were not to blame. They were sincerely trying to introduce improvements but they had no stock of knowledge from which to derive new ideas. The superintendents recruited from country practice, for political reasons, many of them never before in a state hospital, were not in a position to give advice or tell what these institutions needed. Thus it has happened that thousands of dollars have been wasted and little progress has been made in state hospital building.

## Dining Room But No Kitchen

A state hospital is overcrowded. The legislature appropriates $100,000 for a new building. If the superintendent is unable to tell the architect what he wants, how may we expect the architect to know. Often the superintendent has not the faintest notion as to what type of patient the building should be designed to house. It does not occur to him that prevailing styles are enough to drive a man into melancholia. That ward buildings may be homelike and pleasant does not appeal to him. More than once in my experience I have found superintendents who were dumbfounded that I should think their buildings were hideous. Fifty thousand dollars were expended once on one building under such conditions. The architect located it a quarter of a mile from the main and only kitchen and congregate dining room. He provided a dining room in the building, but no kitchen or place where food might be kept warm and no way to get into it with food except through the front door. But he put in a laundry because the building was so far from the institution laundry. While it was designed for men, the plumbing was for women. It was located on the line of a public road traversed by street cars and hundreds of machines daily. The plans did not reveal these incongruities to the superintendent. The architect knowing nothing about the problems of the insane went at it blindly.

Perhaps such things have happened in the planning and erection of general hospitals and for the same reason. It is not my intention to criticise the architect. He has done more than his



The main kitchen of the new Service Building being erected at Alameda County Hospital at San Leandro, Cal., as it looks at the present time. This building is being constructed at a cost of $125,000 and is expected to be one of the most complete of its kind anywhere.

share. He has tried to develop a specialty but he can go only so far.

### Rough Plans by Administrator

The point I desire to make is this: the plans for a hospital, public, general, state or federal, should be roughly drawn by an expert hospital administrator who is competent by study and experience to tell the architect exactly what he wants, what he desires to accomplish and how he expects to accomplish it. The architect's business is then plainly marked out. He should draw the plans as directed. He must fit the building to the site and design it within the funds available. He should know how to do what the administrator wants done and should be free to advise and suggest, even though he contributes nothing thereby. The direction should emanate from the administrator to the architect and not from the architect to the administrator. And in case of dispute, the administrator, if he knows his business, should be trusted to make the decision.

An industrial or commercial corporation desiring to expand its plant knows exactly what is needed,—a building of certain dimensions and height to take care of a certain production. The architect gets his instructions from the corporation and carries them out. It should be thus in the hospital world. No conflict between architect and builder is involved or implied. The architect retains his important and essential position. With the aid he should get from the expert administrator he would make few mistakes. I believe the crux of the whole subject of better hospitals is the professionalized administrator who understands hospital problems, who has a practical appreciation of what such institutions have been created to do and who has vision and imagination to see the possibilities and demands a long way ahead.

## FROM A PATIENT'S DICTIONARY

A dictionary of hospital terms prepared by a thirty-two month patient is published in a recent issue of the *King's College Hospital Gazette*. Some of the patient's definitions follow:

"A hospital is a collection of corridors and stairs supported by slippery floors and contributions.

"A ward is a room attached to a corridor. It contains nurses, beds, patients, and fresh air in large quantities.

"A bed has longitude but no latitude. Its real duty is to beautify the ward. To disarrange a bed is a criminal offense. It is a far, far better thing to have a tidy bed than to be comfortable.

"A patient is the victim of circumstances—a conspiracy between the doctors and hospital authorities. After he has bided awhile he realizes why he is called a patient.

"A nurse is essential for the proper running of the ward. Her chief duty is to watch patients in order to wake them when asleep.

"A clinical thermometer is a morbid cold-blooded instrument which requires a hot-air bath twice daily. The radiant heat necessary is provided by the patient.

"A chart is a piece of paper clipped to a board hanging on your bed. It is provided so that specialists can play noughts and crosses with the students. Has often been mistaken for an underground railway map, but is really the life story of a thermometer set to music.

"The medicine cupboard contains brandy and castor oil. Tremendous quantities of each are used. The brandy is used to camouflage the castor oil and is also used as a restorative when patients feel faint. No patient is ever allowed to feel faint!

"Screens are used by the nurses instead of Sandow's Developer and are considered part of their uniform when on duty. No nurse is allowed to take a screen with her out of the ward when off duty. Most screens do not screen.

"Night commences when blinds are pulled down—day commences when the night nurses have finished their midnight meal. Old patients sleep in the daytime—it is quieter.

"Lockers are a hospital version of dining-room sideboards. Always placed so that a patient cannot get at them, and really provided to gratify the nurses' curiosity. Lockers do not lock!"

## RETIRES FROM ADMINISTRATIVE WORK

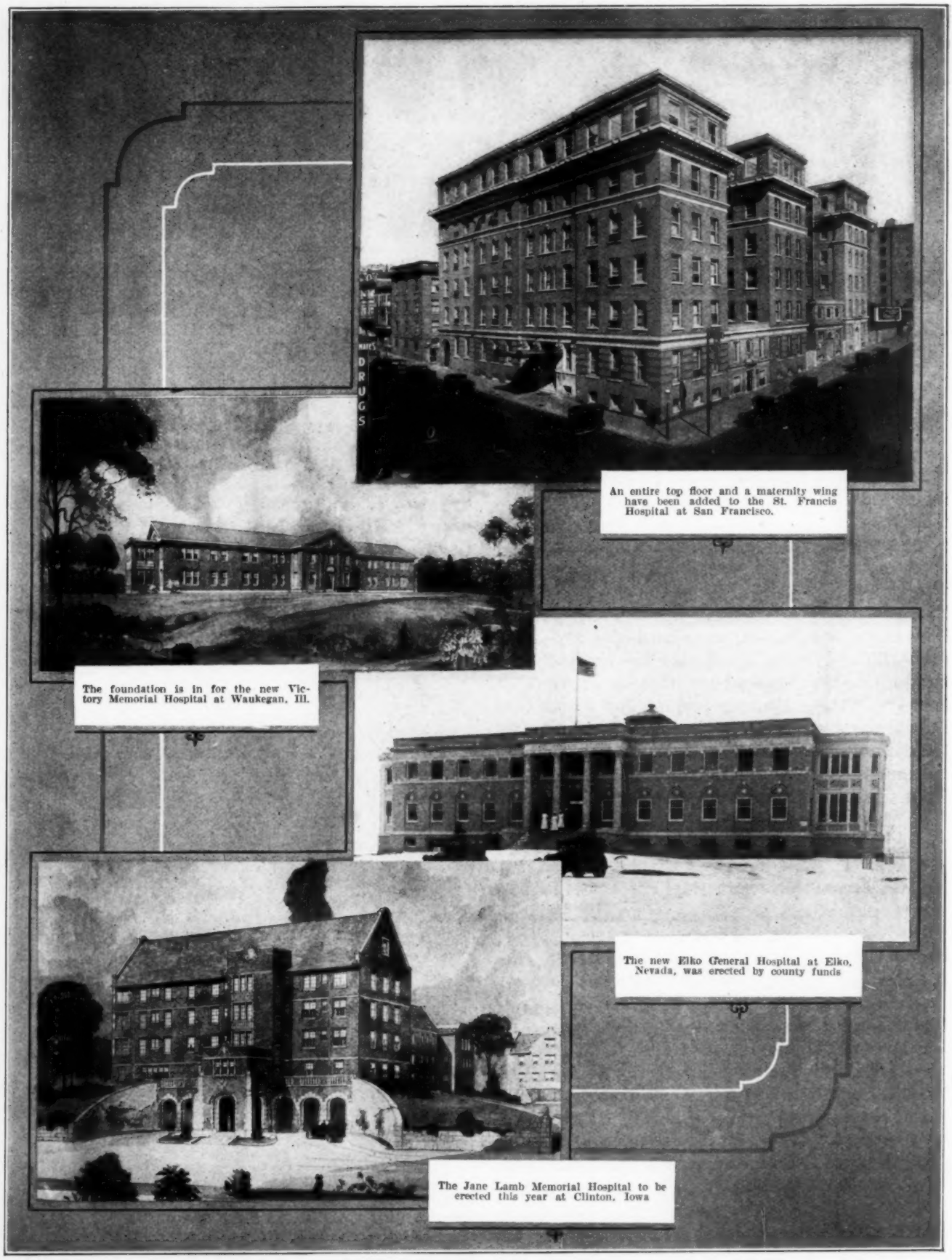
After thirty-five years in executive positions in the hospital field, Miss Mary M. Riddle, superintendent of the Newton Hospital, Newton Lower Falls, Mass., on January 1 resigned her position and has retired from administrative work. Miss Riddle is one of the best known woman hospital executives.

In connection with her duties as hospital superintendent, Miss Riddle was president of the New England Division of the American Nurses' Association; president of the Massachusetts Board of Registration of Nurses; treasurer of the American Journal of Nursing Company; treasurer of the Isabel Hampton Robb Memorial Fund; and was associated in almost all of the state and national activities of her profession.

## A. H. A. ADMITS SIXTH SECTION

Favorable action of the American Hospital Association on the application of the newly organized New England Hospital Association makes the New England association the sixth geographical section of the national organization.

# NEW AND PROPOSED HOSPITALS OF THE MIDDLE AND FAR WEST




An entire top floor and a maternity wing have been added to the St. Francis Hospital at San Francisco.

The foundation is in for the new Victory Memorial Hospital at Waukegan, Ill.

The new Elko General Hospital at Elko, Nevada, was erected by county funds

The Jane Lamb Memorial Hospital to be erected this year at Clinton, Iowa

# THE OPEN WARD VS. SINGLE ROOMS

By EDWARD F. STEVENS, of Stevens & Lee, Architects, Boston and Toronto

PERHAPS it was war conditions which gave big wages and overtime to the artisan and to the common laborer; or it may have been the general uplift of the human race that was responsible for the demand for better living accommodations, better food and clothing, and even better hospital conditions—smaller wards, more private rooms.

The old twenty- to thirty- and, as in some of the war hospitals, 100-bed wards have gone, let us hope, forever. But how, in the much desired private room hospital, are we going to meet the economic conditions of nursing, feeding and general administration which obtain in the open ward? It is evident that we must find some middle ground where the patient may have much of the privacy of the single room with the economic efficiency of the open ward.

While it is ideal to think of a hospital for rich or poor with everyone occupying a private room with private toilet, as in the modern hotel, the conditions in the case of a sick person going to a hospital for treatment are not comparable with those of a well person going to a hotel for a night's lodging. The sick patient is generally helpless and needs diligent care and watching, which care cannot be as economically given in single rooms as in open wards. Even if the expense is disregarded, the supply of nurses and attendants is not adequate to the present demand.

## "The Private Room Appetite"

The great intermediate class of patients who, with the "ward pocketbook," are acquiring the "private room appetite" must be cared for in such a way as to afford privacy to the patient and economy in cost and administration of the building.

It is very evident that the small private room with the integral toilet and watercloset in one corner not only would add tremendously to the cost of the building but, being placed away from the outer air, would prove to be unhygienic and would be prohibited by the building authorities of most cities and large towns; the private room, with the toilet opening to the outside air, would occupy valuable space. So it would follow that some form of ward must be used for public and intermediate classes of patients.

The separation of patients by room, partition, or screen is one of the prophylactic essentials that the war has shown us; for, as one of the great pathologists remarked in regard to the 100-bed wards planned by the government: "If one of those patients contracts a communicable disease, I will guarantee that ten per cent of the men will *die*." So the first essential is separation of beds in the ward.

Segregation for social or religious reasons, or on account of character of disease, age, or sex is desirable. This would mean that our units should be small.

## Sub-Sink Rooms Between Wards

Conservation of the time and strength of the nurse requires that nearby facilities be provided for the securing of water, the emptying of the bedpan, etc., for it is known that these calls are the most frequent. This can be accomplished by providing sub-sink rooms adjoining each of the small wards, one room for two wards. This gives all the advantages of the private toilet and takes a minimum amount of room. With a wash basin in every ward, with utensil hopper and sterilizer between each two wards, and with the watercloset opening to the outside air, the patient, as well as the attendant, has the utmost facility with the minimum amount of travel.

Then with the subdivisions between the beds of three and four or more bed wards, the ward patient would have practically the privacy and comforts of a private room, with a minimum cost of construction and maintenance.

The quiet rooms or private ward essential for every ward unit could be provided with a common toilet with special bedpan-hopper watercloset.

With wards planned as described, each patient would have the maximum amount of air and light, freedom from contact with other patients, and the advantage of a private toilet.

One bathroom, a general sink room, linen room, serving kitchen, and perhaps a surgical dressing room would complete this ward unit.

To illustrate this article, the floor plans of one of the units of a hospital in the South being planned by the writer are used. The kitchen and the administration and operation sections are in other parts of the group, and the food is to be brought to the serving kitchen or to the patient's bedside in heated or vacuum carriers.

## Wards Divided in Units

In each of the ward sections, which may contain three or four or more beds, the partition separating the beds, depending upon the classification, may go either to the ceiling, making prac-

tically separate rooms, or to a height of seven feet, with a one-foot opening below, thus giving the complete circulation of air of an open ward. In each unit there is a wash-basin with mixing vacy. The closet used will be of special type for emptying and washing bedpans, in this way simplifying the service. Each room will be equipped with lavatories, nurses' calls and telephones, gen-

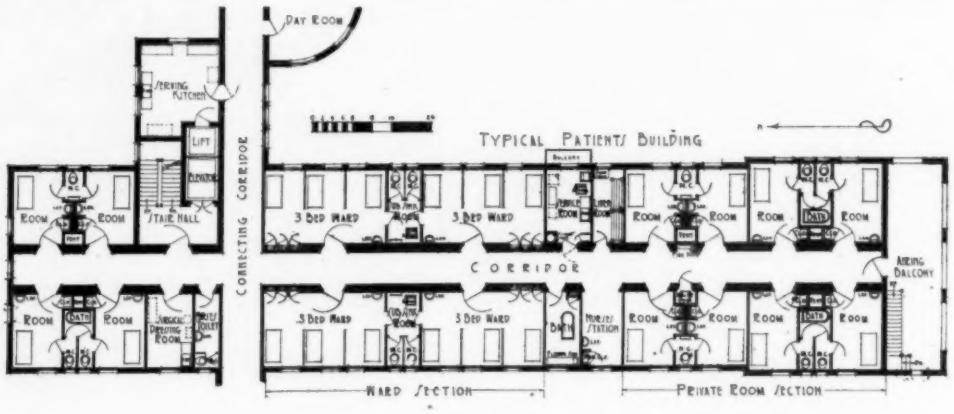



Fig. 1.

wrist-control valves, lockers or closets for the clothing and effects of each patient, and between each two wards a common toilet or sub-sink room, providing the minimum distance for the nurse to travel in discharging her duties, each nurse being able to have general surveillance of two of the ward sections.

A treatment of the private room and the private section is shown in the accompanying plans (Fig. 1). A common toilet is placed between two private rooms, and privacy is maintained by the use of a special locking device such as may be found in European sleeping cars. The opening of one door automatically locks the other, insuring pri-

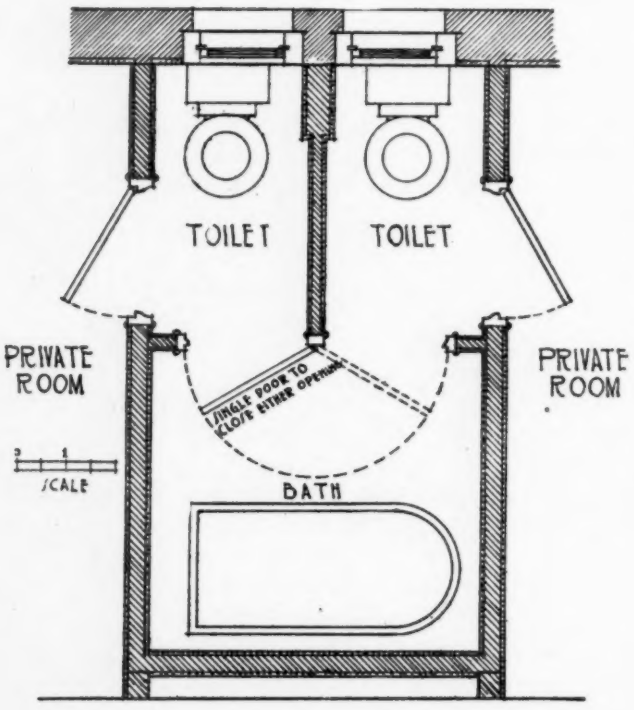



FIG. 2

eral and bedside lights, and a built-in clothes closet through which the room will be ventilated.

## Facilities for Private Bath

While the bathtub is used little by the average patient, suites of rooms with bathtubs give opportunity for the individual bath when desired. To make these private suites more flexible and at the same time enable members of the family to occupy adjacent rooms, one economic feature here shown and one which the writer has used in a number of hospitals is the form of door used in closing the watercloset from the bath. This form of door always gives outside light and air to the bathroom. This is accomplished by using a single door to close at will either one of two openings, as needs require, always providing a watercloset for each room and leaving it optional to assign the bath with either room. This device is shown in Fig. 2.

A general sink or duty room should be provided in each unit, where the needed preparation, sterilization, etc., can be done.

With the individual cubicles and rooms, the need of a surgical dressing room is slight. With the portable hot table, the size of the serving kitchen can be reduced.

The saving in area over the single and integral toilet which in most large centers *must* open to the outer air is very great. With the three-bed ward here shown, the saving in area of room occupied by patients would be about twenty per cent over that of the single room with connecting bath, and the saving in construction would be even greater. The efficiency of administration would be equal to that of the ward, and the privacy would be nearly equal to that of the private room.

# PLUMBING ECONOMIES

By H. A. DURR of H. A. Durr & Company, Consulting and Designing Engineers, Chicago

VERY few doctors or boards of directors planning to build a hospital realize the cost of the mechanical equipment which will be required to aid in making their proposed hospital habitable, comfortable and sanitary. The cost of this equipment is often 35 to 40 per cent of the cost of the total building project, and the biggest single mechanical equipment item is the plumbing installation. This item of plumbing is accordingly one of great importance and is worthy of much consideration. It is not uncommon for a plumbing installation to cost as much as $25,000 in a hospital project totaling $250,000 to $300,000. Because of this high cost, great care should be exercised in settling on the plumbing equipment and every possible saving should be given consideration.

In the first place, considerable money can be saved by engaging the best mechanical engineering talent to develop the plumbing layout, secondly, the architect should be requested to do his utmost in planning the hospital building to permit of a simple installation of plumbing piping. For example, the receiving department, which requires more or less plumbing equipment and is usually located on the first floor of a hospital, should be so placed that the stacks of piping required for it would accommodate plumbing equipment on the floors above. Of course it is not always possible to locate all departments in a hospital so that those requiring plumbing fixtures will be placed vertically above one another, thereby requiring a minimum number of plumbing risers, but there is no question that considerable saving could be effected if the requirements of this rule were given more heed.

Sanitary or plumbing codes prepared by the different city and state authorities invariably refer to waste pipe and vents but rarely to water supply. Abundant and good water supply is essential in any hospital and oftentimes to make sure of providing sufficient water, the tanks, hot water heaters, piping and other water equipment are installed larger than need be, thereby increasing the first cost of an installation. This, of course, can be obviated if plans are fully developed by competent engineers.

## Piping Layout Should Accompany Plans

After the architects have determined in a general way upon the hospital plan for each floor, a mechanical engineer should start laying out a pipe riser diagram and, with the aid of this, discover whether the locations of some of the plumbing fixtures could be restudied and changed so as to obtain a less expensive piping layout. This scheme of procedure will often give the owners a hospital that is simpler and cheaper and at the same time better because of less bends and fittings in the piping that may clog up and cause future trouble.

The mechanical engineer should next develop a complete set of piping plans showing the layout in detail and on this plan should indicate everything possible for the two-fold purpose of getting all quotations based on exactly the same requirements and at the same time make it possible for plumbers to prepare an intelligent bid by leaving nothing to be guessed at, thereby eliminating any sum which might be included in the proposal to cover contingencies.

If the plumbing layout is worked up in detail a vast amount of the specification work can be eliminated. A plan is supposed to be a picture for the trained mechanic and pictures invariably portray more to the average person's mind than volumes of typewritten specification. Great stress should accordingly be laid on the development of complete mechanical plans in addition to the architectural plans and with these the plumbing specification on a hospital project can be greatly shortened and simplified. Good mechanical plans are also invaluable after the building work is completed for most of the piping is run concealed in walls, furred spaces and partitions where it is impossible to see the service piping. It is a very expensive matter to repair piping defects three or four years after a building is finished unless such plans are available. Thorough drawings not only lessen the first cost but the repair charges as well.

## Pipe Shafts Should be Provided

Plumbing specifications can be simplified if a little space is allotted for pipe risers. As it is now, in most new projects there is practically no space given over to piping and it is supposed that every bit of it will be concealed in partitions. If pipe shafts and pipe chases of reasonable area were provided in a hospital, it would be unnecessary to install every piece of plumbing material with the same degree of accuracy that is resorted to in many buildings as designed today, and on top of all, a little clear space would be left around the pipe risers so it would be possible to get at them if repairs were required. In many institutions now, where fireproof construction is employed, it is impossible to make repairs without

excessive cost and annoyance owing to the cramped condition of pipe services. Pipe services in a hospital are much like the arteries and veins in the human body, they must remain in service continuously if the structure is to function properly.

Where pipe shafts are provided, another saving can be effected. The water service to each bathroom can be controlled by two valves, one for hot and one for cold, while with the scheme regularly employed five valves are installed, two valves for the bathtub, two for the lavatory, and one for the closet. Practically the same degree of control is obtained with two valves at much less cost.

### Some Unnecessary Fixtures Enumerated

In the better grade of hospitals where toilet rooms are required for each private room, there is no need of providing separate bathtubs for two adjoining private rooms. Tubs are used but little anyway and one tub will suffice for two rooms if laid out with doors from the bathroom leading into each of the private rooms, as shown in the accompanying sketch, marked "A." Two separate toilet rooms with their individual lavatories should be provided as shown. The elimination of 50 per cent of the private room bathtubs not only effects a saving in fixtures but also a saving in the size of the hot water heaters, tanks and piping. Smaller equipment can be used throughout, for the maximum demand for hot water at any one instant is greatly reduced.

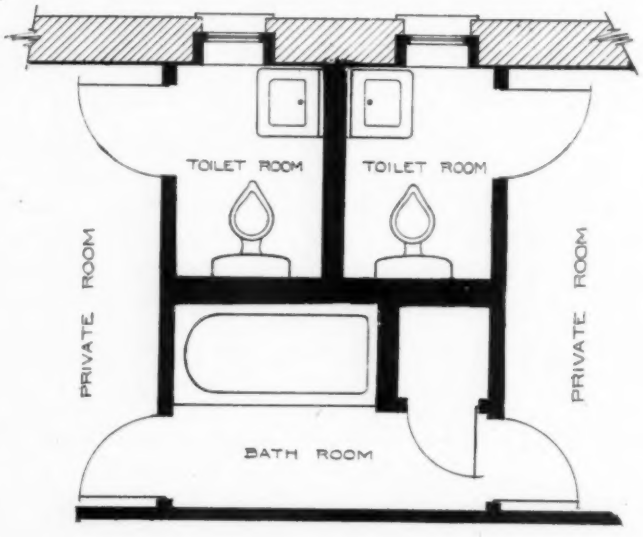
Urinals are as unnecessary in the average private hospital as they are in a private home, yet they are very often installed. A porcelain urinal stall is not a cheap fixture by any means, with depressed floor construction, drain and water supply. There is always a great number of closets in a hospital and with them a urinal merely adds to the cost of a plumbing installation, takes up valuable floor space and adds nothing to the usefulness. In public hospitals and large sanatoriums where large public toilet rooms are required, a urinal might be of some value, but these are practically the only places.

### Individual Vent Pipes Not Essential

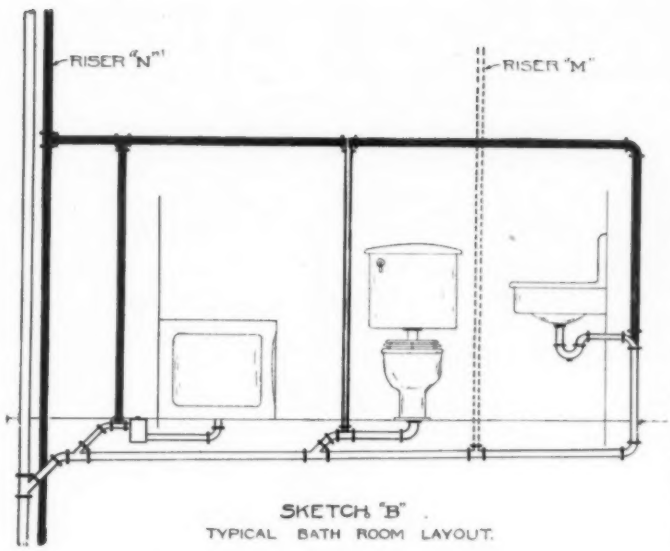
The great majority of hospitals are less than six stories in height and in such buildings it should be unnecessary to use individual vent pipes from each fixture as is now required by ordinance in some of the large cities. This rule of individual venting is possibly desirable in tall buildings where there is a chance of a slug of water dropping from a great height and attaining sufficient velocity to create a considerable suction on the water sealed traps connected with the fixtures on the lower floors. It is presumed that this suction will syphon the water out of the trap on a fixture and permit sewer gas to escape into the rooms until the fixture is again used and the trap again sealed with water. This rule of individual venting is strictly enforced in some of the large cities, including Chicago, while in numerous other cities, including Detroit, they do not have such a rule and neither do they have any trouble in the average height of building from sewer gas because of the breaking of water seals. The Henry Ford Hospital in Detroit is not provided with individual vents. If the same building were erected in Chicago the extra vents would be required, thereby necessitating a probable additional plumbing cost of over $15,000 for this one item. If such an ordinance is unnecessary in one city it is also unnecessary in another. There is no question in the writer's mind but that individual vents in a building six stories or less in height are not only a luxury but a non-essential item. The relative amount of piping and fittings required to satisfy the two city ordinances are shown in sketch "B" where the main vent risers "M" and "N" would be almost identical. Riser "M" shown in dotted line with its short connection to the drain pipe would be required in Detroit, while Riser "N" with the multitude of individual vent connections to each fixture, all as shown in heavy line, would be required in Chicago.

### Standardization of Plumbing Ordinances

From the above data it can readily be seen that much can be done in the standardization of plumbing ordinances. It is unfortunate that more has not been accomplished to establish uniform rules for all cities and states, which would combine and coordinate all local ordinances, mak-




SKETCH "A"
TYPICAL FLOOR PLAN




SKETCH "B"
TYPICAL BATH ROOM LAYOUT.

ing exceptions only where imperative to accommodate peculiarities in certain localities. With uniform rules and standards throughout the country, it would be possible to use plumbers from any city in any other city in case of shortage of men, without fear of them making a mistake owing to some peculiarity in the local ordinance or code. Uniform rules would aid greatly in cheapening a plumbing installation.

One of the most expensive and practically useless devices in a fireproof hospital is a fire pump. The corridors and stairways in a fireproof hospital are unlike those in the average hotel, for carpets and rugs are never used in them. In fact, there is nothing in a fireproof hospital that can burn except small rugs, the window curtains, and bed and table linen. If such material did burn, the fire could be put out or at least controlled by the use of fire extinguishers or buckets of water long before a fire hose and pump equipment could be placed in action. The cost of the fire hose, stand pipes and pump equipment in a large hospital involves a tremendous sum of money.

A saving which is rarely ever taken advantage of can be made by eliminating all pipe covering and tank insulation work from the plumbing specifications. The application of insulating materials to any piping system is handled by a special group of workmen in most cities and is a trade in itself. If handled by the plumber he must sublet the work to this particular pipe covering trade and, of course, add a carrying charge of possibly ten per cent above the quotation made by his sub-contractor. This insulating work for the plumbing equipment can be let, along with that required for the steamfitting and refrigerating equipment, direct to a contractor handling insulating work exclusively. This will automatically eliminate the ten per cent carrying charge above referred to on not only the plumbing but the steamfitting and refrigerating pipe covering as well.

## Difficult to Reduce Fixture Cost

In a $25,000 plumbing installation the fixtures themselves for the average hospital would probably cost $8,000. This is the largest single item which goes to make up the total plumbing cost, and unfortunately not a great deal can be said about reducing it. The cooperation of the doctors must be obtained in regard to the elimination, simplification and standardization of certain plumbing fixtures. Many doctors think of the plumbing fixtures the same as they do of the instruments in the operating department. If a special instrument will aid materially in making it possible to handle a surgical case more quickly or better, that particular instrument is purchased. In looking over a list of plumbing fixtures for a new hospital, the same line of thought is invariably followed.

Standardization of trimmings for fixtures will result in economies, but to accomplish this, doctors must standardize on their requirements. For example, in some hospitals water for certain lavatories will be controlled in three different ways in the different parts of the building, in addition to being controlled by means of standard faucets in other locations. In one location knee-acting control will be provided for the faucets, in another elbow-acting, and in a third, foot-acting. The installation of these three types of control means that the plumber must spend considerable time familiarizing himself with the manner in which each should be installed, in addition to seeing that the floor or wall construction be arranged to suit the varied requirements. The prime need of any of these three controls is to eliminate the necessity of soiling or contaminating one's hands by using them to operate a faucet or vice versa. Any one type of control will do,—why not pick out the one requiring the least in the way of repairs?

## Class "A" Fixtures Not Essential

In nine cases out of ten a single sentence is placed in the average plumbing specification stating that fixtures shall be Class "A." This is done from force of habit, but a man trained to economize on the various hospital projects he handles will require Class "A" fixtures in the operating departments and other important sections of the building, but permit Class "B" fixtures in the less important locations where it doesn't make so much difference if a fixture has a blue mark, a slight blemish or a warped surface.

There are other minor economies which can be

made in fixtures and trimmings, but the big saving on new construction is to be made in the service pipe and general layout. Real study should be given to the layout of this material so as to use a minimum amount of it, run in the most direct manner possible. Every unnecessary foot of service piping installed means an unnecessary foot of pipe insulating material, which is also expensive.

In addition to these various items, the doctors or boards of directors planning to build a hospital should bear in mind that it is much cheaper to indicate piping on drawings in an engineer's office than it is to have a plumber actually install the piping in a new hospital and, when it is discovered that it interferes with some of the material installed by other mechanics on the building, upon order tear it down and send in a bill for extras.

The hospital board should select simple, strong and easily repaired brass trimmings for plumbing fixtures and endeavor to use as few of the special vitreous and porcelain fixtures as possible. It should spend a small amount of money to have plumbing and all other pipe systems laid out by engineers trained in the design of hospital structures, and save money on the total cost of the plumbing installation.

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# SOME ESSENTIALS OF HOSPITAL PLANNING AND CONSTRUCTION

By GUSTAVE W. DRACH, Architect, Cincinnati, Ohio

*On the multiple considerations which confront hospital administrator, trustee and architect when visualizing a new plant, Mr. Drach, a Cincinnati hospital architect, touches briefly in this article. From selection of site through the mazes of planning and construction, Mr. Drach from his store of experience points the way. His generalizations are made to apply in most cases to the problems which vex the builder of both the small community hospital and the lofty metropolitan institution. At equipment the architect withdraws from the field with the observation that what in equipment seems ideal when hospital construction is begun is apt to be antiquated before its completion.*

THE first consideration in building a hospital is the site. Great care should be taken in its selection. Grounds must be sufficiently large to give ample space for air and light, and the structure must not be crowded between other buildings so as to prevent the sunlight from entering every room at some time during the day. Courts and light wells must be avoided. The question of thorough drainage is also not to be overlooked when selecting a hospital site.

Building plans should give the administrative department a central location, thereby reducing to a minimum the distance between the different parts of the hospital and saving much time and energy. Provision should be made for a separate entrance at the side or rear for ambulances, supply trucks and other vehicular traffic which would be objectionable in the front of the building. Proper accommodations must be made near this entrance for the examination of patients. An elevator of size sufficient to accommodate a bed or stretcher should be provided for near the receiving entrance, so located as to be convenient to wards, operating rooms and roof garden, if the latter is contemplated. A receiving room for supplies and parcels should be located close to this entrance, with proper storerooms for supplies. Public halls, stairs and elevators should be placed conveniently close to the administrative department and wards and should be enclosed with fireproof walls and provided with fireproof doors, so as to reduce the fire risk and eliminate traffic noises. If the central hall leads to cross halls, then wards should be cut off from the cross halls with fireproof doors.

In addition to the general administrative offices there must be an information desk, waiting rooms, consultation room, a room for the physicians provided with accommodations for hats, coats, etc., an office for the head nurse, and public toilet rooms for men and women. If the hospital is in the South, separate waiting rooms must be provided for colored people and separate service arranged throughout for them. The hospital must, of course, be so planned that the different services are conveniently located with relation to each other, the medical, surgical, dermatological, neurological, orthopedic, obstetric, pediatric, etc.

Open wards should allow about 1,200 cubic feet per person, and their design should permit the arrangement of beds so that the light need not shine in the patients' eyes.

Toilet rooms should connect directly with the wards and should have outside light and ventila-

tion. The bathroom may adjoin the toilet room and be connected with it. Several small single rooms for isolation purposes must be provided for close to the ward. Nurses' stations should be located near the entrance of each ward.

Diet kitchens must be of ample size to accommodate the service and so located as to be of easy access to the main kitchen, wards and private rooms.

### Sanitary Equipment for Private Rooms

Proper provision must be made for storing patients' clothing, either adjoining each ward or near the receiving entrance. Where there are private patients, the private rooms will have closets. Rooms for linens and blankets, bandage and rubbish disposal, slop sinks, mops, brooms, bed pans, small sterilizers, and similar equipment just outside the wards must not be forgotten. A workroom for nurses for each ward is also very desirable.

Where a number of private rooms are arranged for, it would be well to have some with private baths and practically all with toilets and lavatories. All private rooms should have lavatories with hot and cold water. Several of these rooms should also have sitz-baths.

Each ward should have a solarium open on three sides, enclosed with sash so that it may be closed and heated in cold weather. It must be of sufficient size to accommodate a number of beds, depending upon the capacity of the ward. The solarium in a ward containing only private rooms is readily converted into a desirable day room for convalescent patients.

If a roof garden is provided, part of it should be roofed over and enclosed with glass doors which may be opened or closed as weather conditions may demand. Provision must also be made for toilets and lavatories and a small serving kitchen. One elevator of sufficient size for a bed must run up to the roof garden.

### Operating Room Requirements

Operating rooms should have north light and be directly connected with a sterilizing room, and in larger plants with an instrument room. There should also be anesthetizing rooms and recovery rooms, a nurses' workroom for making bandages, and a room for the nurse in charge. A plaster room is also necessary. Smaller operating rooms should be designed for special work, such as cystoscopic, eye, ear, nose and throat operations. The floors and walls should be of some impervious material, preferably tile of a vitreous nature. Although it has been customary to use white tile, a tile of pale green has proved very satisfactory in that it is soft and lacks the glare of white. A small laboratory in connection with the operating rooms is desirable. In the operating pavilion must be a locker room, clean-up room, showers, toilets, dressing room and waiting room for the surgeons.

The maternity ward should be isolated as much as possible from the other parts of the hospital. A separate pavilion or building would be desirable. In planning a maternity ward, the delivery room, creche and clean-up rooms should be separated as much as possible from the open ward or private rooms, to eliminate undesirable noises from these rooms.

If a pathological laboratory is contemplated, it should consist of one large laboratory, a small one for special work, and a record room. The x-ray room, with its record rooms, lockers, toilets and bathrooms for the physicians, and the drug room, could be placed in a wing with these laboratories, in which case a central location must be chosen, yet one sufficiently isolated from the wards.

The kitchen must be centrally located and in close proximity to the elevators or carriers leading to the diet kitchen and to the storerooms from which supplies are drawn. It should have direct access to the outside, should be well lighted and ventilated, should have impervious floors with drains, and walls of some hard, smooth material.

### Accommodations for Staff and Employes

Dining rooms must be provided for nurses, doctors, interns and employes. The location of living quarters for superintendent, nurses and interns must depend largely on the size of the plant. A separate building for the accommodation of nurses is ideal; in any instance they should have at their disposal a large study room, diet kitchen for lectures and demonstration, a gymnasium, ample living and reading rooms which can be converted into entertainment halls, and a storage room for trunks.

An assembly room is especially necessary in a large institution. Its uses are many: lectures, entertainments for nurses and convalescent patients, staff meetings, board meetings, and similar purposes.

The morgue, with postmortem room adjoining, should be located in the rear of the hospital, with access from the outside.

In a large institution it is most desirable to have the power plant in a separate structure connected with main building by means of a tunnel. This building can also contain the laundry, carpenter shop, paint shop, a large sterilizer for mattresses, and perhaps rooms for outside help.

The exterior of the hospital should be simple and dignified in design.

This, I think, gives in a rather broad way, without going into any minute detail, the funda-

mental requirements in planning a hospital.

Now as to the construction. To my mind every hospital building should be fireproof. Ample provision should be made for convenient exits; different units should be separated from main corridors, stair and elevator halls by fireproof walls and doors, and all stairs and elevators placed within fireproof walls or partitions. The floor construction, walls and partitions should not only be fireproof but also soundproof and verminproof. The interior finish should be very simple, woodwork eliminated wherever possible, door and window casing avoided. Doors are best solid without panels or mouldings, the severity of the plain surfaces being reduced somewhat by the introduction of a narrow flush inlay of a lighter or darker color, giving the effect of a large panel. The doors should be so hung as to fit close and prevent slamming, and of sufficient size to allow the entry of a hospital bed. The doors and windows, if possible, should be provided with transoms hinged at the bottom. Transoms over doors can well be made of wood or fireproof material instead of glass, thus avoiding the glare of the hall lights at night. Window transoms should have metal shields at the sides to prevent draughts. Sills should be of marble. Walls are best finished with hard plaster, all angles rounded, and painted with enamel of some warm, pleasing color.

How to treat floors has been a debatable question for many years and has not yet been solved satisfactorily. Floors should certainly be of a material which is non-absorbent and they should possess sufficient resiliency to make walking easy and noiseless. One of the most satisfactory solutions of this vexing problem has been the combined use of terrazzo with a sanitary base, the terrazzo extending several feet from the wall, and a tile floor of one of the cork preparations in the center, laid flush with the terrazzo. Linotile and various other makes of rubber tile have given good results. Linoleum, a less expensive material, has also given fair results.

Vitreous tile for the floors and glazed tile for the walls of bathrooms and toilets have probably given the best results, although terrazzo for this purpose has proved quite satisfactory in many places.

Plumbing fixtures should be carefully selected and of such a type that all parts are easily cleaned; they should be wall hung if possible. Supply lines should be of brass and of such proportion as to give ample flow. If waste and soil lines and drains are of sufficient size to do the work for which they are intended, stoppage can be eliminated; enough cleanouts must be provided for any emergencies. All pipe connections should come not through the floors but through the walls above the base. Bathtubs should be set directly upon the floor with no space under them and so placed as to allow the nurse, in handling the patient, to walk all around the tub. A series of the tubs should be arranged for continuous baths.

Care in the location of lights should be taken so that there will be no glare on the patient. The operating room lights ought to be equipped with double electric service, so that if a fuse blows on one line the other line will continue to do duty. Sufficient base plugs must be provided for local lighting for each bed as an aid to the physician as well as a convenience to the patient. The lighting system must be sufficiently elastic to allow the control of lights singly or in series from separate switchboards.

Silent signal systems must connect from the nurses' station to each bed. Telephones connecting the different departments of the hospital and outside lines must be provided in each nurses' station. It is also desirable to have plugs for portable telephones in some of the private rooms. An electric signal call for doctors and superintendent should be placed in the hall outside of each ward.

Arrangements for a doctor's register should be made at the information desk. Electric registers are frequently used in large institutions.

## Problems of Heating and Ventilation

Heating and ventilating problems take careful study. A competent engineer should have charge of this important branch of work, especially in large installations, and a competent man is needed to operate the plant after it has been installed. Radiators of the type that can be set up from the floor and with parts easy to clean are desirable. They should be wall hung and protected so as to prevent patients from accidental burns. Risers should be concealed if possible, and long horizontal lines to radiators in wards, rooms and corridors eliminated. It is essential that all risers be accessible in case of a break or other accident.

The method of ventilating depends largely upon conditions. All toilet rooms, bathrooms, wards and kitchen ought to be supplied with fresh air inlets and air exhausts. Halls and corridors should have exhausts. Private rooms may be ventilated locally.

I shall not attempt to go into the equipment and furnishings of a hospital. These cover a wide scope of detail and improve so rapidly that many things which we think are perfect when starting to construct a hospital are obsolete and antiquated when the building is ready for equipment.

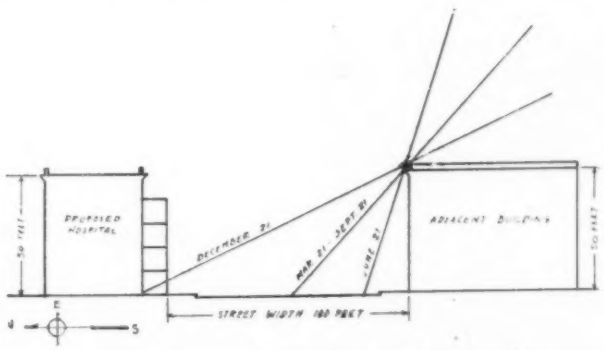
In this paper I have not attempted to give any special details, only to call attention to the essentials required in a hospital, some of which might be overlooked.

# SUNLIGHT FACTOR IN PURCHASING PROPERTY FOR URBAN HOSPITALS

By RICHARD RESLER of Resler & Hesselbach, Architectural and Consulting Engineers, New York

THE purpose of this paper is to discuss briefly an important factor that arises for consideration in purchasing property for hospitals located in cities. Effort will also be made to caution hospital executives who contemplate the purchase of such property to avoid the all too frequent mistake of acquiring land which, on account of sunlight restrictions, is totally unsuited for city hospital purposes.

Usually in the lay mind a parcel of land suited for a hospital in the city is one having sufficient area and so situated to permit the wards to have southern exposure.




OBSTRUCTIONS TO ANGLES OF LIGHT AT 12 NOON

Diagram 1.

However, in city hospital planning these considerations of site area and orientation are by no means conclusive, as adjacent high buildings frequently develop an artificial sky line which on account of light obscurations makes the property impractical for housing the sick, even though the other factors such as approachability and future expansion, might be advantageous.

Diagrams Nos. 1 and 2 show by comparison the conditions of sunlight that will obtain at 12 o'clock noon, when an assumed artificial sky line is taken into consideration.

Notwithstanding the fact that a great number of hospitals in our cities today have restricted sunlight during the winter months owing to the reasons stated, hospital executives are at the present moment acquiring sites regardless of what the artificial sky lines are.

Even though hospital executives engage the services of an architect or engineer prior to purchasing the land, the painstaking studies required to develop graphically the shadows cast by adjacent buildings or artificial sky line are stupendous and frequently the resultant geometric diagram baffles even the designer. To the lay mind the final development is a conglomeration of lines only.

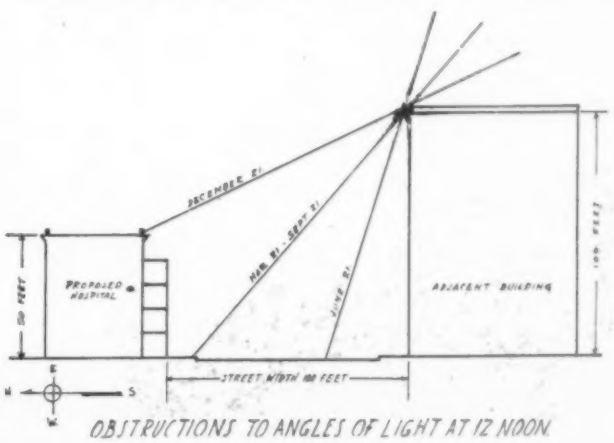
With this situation in mind the writer has for a long time advocated the study of city hospital planning with miniature scale models of the proposed hospital and the adjacent buildings, or artificial sky line. In the furtherance of this idea a wire frame or basket has been designed representing the celestial sphere which is used in conjunction with these models.

This wire frame or basket determines in a practical manner the angle of the sun's rays at any hour of the day for the summer and winter solstices and the equinoxes. The angle of sunlight is ascertained by placing the basket over the models, keeping the relative position of the compass the same on both.

The shadows are easily determined in a darkened room by the use of a small electric lamp and parabolic reflector representing the sun, the source of light being placed a sufficient distance away from the models so as to prevent distortion of the light rays.

It is surprising that this method of determining shadows is not more in favor with architects and engineers, as it is much simpler than the graphic method and easily comprehended by the layman. The relative position of the buildings can be studied and moved to suit requirements, courts can be enlarged or reduced in size and sunlight penetration in wards and rooms can receive careful consideration. Furthermore, the outline of the shadows at stated times of the day and month can be readily understood and compared.

From the foregoing it would seem that too




OBSTRUCTIONS TO ANGLES OF LIGHT AT 12 NOON

Diagram 2.

much stress cannot be placed on the artificial sky line phase of hospital planning, and it is with the hope that the caution herein advanced will be heeded by those contemplating the acquisition of property for this purpose that this article is written.

# VENTILATING THE HOSPITAL KITCHEN, LAUNDRY AND LABORATORIES

By A. M. FELDMAN, M.E., Consulting Engineer, New York

THE ventilation of hospital kitchens, laundries and laboratories is a matter, not of supplying fresh air, but of removing steam, vapors and odorous fumes that arise from ranges, flat work ironers, steam kettles, washers, dryers.

For successful ventilation, hoods should be arranged over the above mentioned sources at a height not much above the head and extending about two feet beyond these sources on all sides. Over laundry flat work ironers it is best to attach to the hoods hinged metal aprons with glass inserts, suspended close to the frame and rolls of the flat work ironers, so that no steam may escape into the room.

The hoods should be connected with a system of duct work and exhaust fans. (Figs. 1 and 2.) The sizes of ducts and individual connections should be proportioned that there is no short-circuiting to prevent the hood or portion thereof nearest the fan from pulling more air than those farther away. If the hood is a long one, the duct should extend over the top the full length of the hood, with distributed sliding and adjustable dampers. (Fig. 3.)

In laboratories where there are several enclosed compartments not adjacent to each other in which chemical reactions are taking place, it is the writer's practice to install small exhaust fans for each compartment or hood, rather than one large fan for all. It is more economical in power; for since not all compartments or hoods are used simultaneously, there is no advantage in pulling air from hoods not in use. Besides the factor of economy there is an added element of safety; under this system the whole laboratory is not dependent on a single fan and motor.

It is advisable to provide additional exhaust registers in ceilings of

Fig. 1. Hoods and ducts over washers in the laundry of the Montefiore Hospital for Chronic Invalids, New York

Fig. 2. Hoods over dryers and ironers in the laundry of the Montefiore Hospital for Chronic Invalids

Fig. 3. Full-length hood and duct with distributed sliding and adjustable dampers, such as is used in kitchens of the same institution

kitchens, laundries and laboratories for steam, vapors and fumes that escape outside of the hoods.

For the proper operation of the exhaust system there should always be provided an intake of outdoor air. It is sufficient to rely on incoming air from corridors and other rooms provided there are open doors between them and the kitchen or laboratory; otherwise a window should be kept open.

It may be added that in cooking potatoes with steam and without water, one to two pounds pressure is sufficient. The writer has had occasion to observe that in some kitchens the same pressure of steam, about 35 pounds, was used as in the jacketed kettles. The result was that a great amount of steam was wasted, and the exhaust ventilating system would not handle the excess of steam.

# CONSTRUCTION OUTLOOK FOR 1922

By HORACE H. HERR, Editor, The American Contractor, Chicago

*If hospitals have the necessary funds available to carry out their building programs, Mr. Herr, editor of The American Contractor, thinks they will encounter no unusual hazards if they put their projects under way at once. Immediate action, he believes, will allow the completion of such projects before competition for labor and materials tends to force up the ultimate cost of construction. During the last half of the year Mr. Herr looks for an appreciable advance in construction costs. The general material index may be expected to remain as it is now for the next few months. Hospital construction has been subnormal and this accumulated demand will augment normal requirements of 1922.*

As 1922 breaks on an uncertain world, conditions are more favorable to construction activities than they have been since 1914. Some very extravagant prophecies are being made on prospective building operations. If only building material prices and labor costs are considered, these forecasts are not unreasonable, but, unfortunately, there are several other factors which cannot prudently be ignored.

No basic industry can approximate maximum prosperity in the face of a general business depression. It may be more active than other industries because of conditions peculiar to it, but the modern industrial organization is too complex and interdependent to permit one industry working in high while others are working in low gear. It is well, therefore, to have in mind the fact that however promising the outlook may now be for building and construction work, these activities are bound to reflect in some measure the general average of conditions in all business. In the agricultural states, for example, while the potential demand for building is exceptionally great, the demand cannot exert its full force until there is material improvement in prices for farm products and a substantial liquidation of rural credits which froze when the price thermometer began to register lower and still lower values for farm products.

There is convincing evidence that the building record for 1922 will surpass the record of 1921. Perhaps the chief justification of this expectation rests in the steady increase in building activities since July, 1921. The statistics on construction contracts awarded show that the monthly totals from January to June, inclusive, in 1920, were higher than in the corresponding months of last year. The July total for 1921 was greater than the July total in 1920, and the monthly totals for August, September, October, November and December, 1921, were uniformly higher than for the corresponding months in 1920. When building activities continue increasingly active for six months with price and labor conditions constantly improving, the obvious conclusion is that the industry is approaching a season of abnormal activity, and this conclusion is the more substantial when investigation discloses an insistent demand of a magnitude capable of utilizing the maximum productive capacity of the building industry.

Analysis of statistics on contracts awarded, as compiled by the F. W. Dodge Company, in the territory east of the Missouri and north of the Ohio rivers, shows that the amount of work that goes ahead in a given year is approximately two-thirds of the total of contemplated projects reported in the previous year. On that basis and in the territory mentioned, the money valuation of the building program in 1922 should be slightly more than three billion dollars. The total for the contemplated projects reported in 1921 was $4,747,723,380, the figures for the final week in December yet to be added to the total. This is practically the total for contemplated work reported in 1920 from which came building activities in 1921 totaling approximately two and one-half billion dollars.

Having in mind the fact that these statistics are from the northeast quarter of the United States, in which population and industrial activities are congested, it is a very conservative estimate to place the money valuation for the 1922 building program in the remainder of the country at one billion dollars. This gives us a four billion dollar prospect in the building field for 1922.

To this vast sum must be added the millions which will go into highway construction, and it is estimated by competent authorities that from four to six billion dollars must ultimately be spent on our rail transportation systems.

This is the potential demand of varying insistence. There is no likelihood of the demand becoming 100 per cent active in 1922. Indeed, such a development would be of questionable benefit, for such a volume of construction would create demands for materials so insistent that spectacular price advances could not be avoided and, judging from past history, prices would advance again to such high levels that ultimately the buyer's strike would be revived, with a subsequent period of stagnation and embarrassing deflations.

That the building program in 1922 will approximate a total of three billion dollars is not an unreasonable expectation. With the exception of New York City and St. Louis, Mo., labor rates have been substantially reduced from the levels of a year ago. Everywhere labor efficiency has improved and the lower wages and improved efficiency have reduced the labor cost at least thirty per cent from the level of a year ago.

The following tabulation of indices on material prices gives rather a clear picture of current price conditions. This is the latest information published by the Division of Building and Housing of the Department of Commerce and it is worth while to observe that the index for all building materials advancing in October and November, shows only a slight reduction in December. By comparing the December index with the peak price index, one may form his own idea about the liquidation of prices:

*INDEX NUMBER*

| Commodity | Peak Date | Peak Index | Oct. 1921 Index | Nov. 1921 Index | Dec. 1921 Index |
|---|---|---|---|---|---|
| Building materials | Mar., '20 | 310.0 | 165.3 | 169.5 | 163.2 |
| C. brick, kiln, Chicago | Oct., '20 | 251.1 | 173.6 | 174.8 | 180.8 |
| Gravel, New York | June, '20 | 340.0 | 226.9 | 226.9 | 198.6 |
| Hollow tile, Chicago | June, '20 | 236.9 | 144.7 | 128.3 | 108.0 |
| Lime, common lump, average, U. S. | Oct., '20 | 285.8 | 213.1 | 212.3 | 211.3 |
| Portland cement, plant | Sept., '20 | 192.9 | 148.4 | 148.4 | 148.4 |
| Sand, New York | May, '20 | 302.5 | 252.1 | 252.1 | 201.7 |
| Reinforcing bars, Pittsburgh | July, '17 | 327.1 | 119.9 | 119.9 | 109.0 |
| Wire nails, Pittsburgh | Jan., '20 | 252.9 | 164.9 | 161.6 | 153.3 |
| Structural steel, Pittsburgh | June, '17 | 331.0 | 115.9 | 109.2 | 99.3 |
| Douglas fir, No. 1, mills | Jan., '20 | 407.3 | 114.0 | 124.9 | 124.9 |
| Hemlock, New York | Feb., '20 | 235.3 | 153.8 | 153.8 | 153.8 |
| Spruce lath, New York | Jan., '20 | 396.8 | 230.5 | 207.2 | 207.2 |
| Red cedar shingles, mills | Feb., '20 | 346.8 | 168.8 | 145.9 | 148.5 |
| White oak, New York | Mar., '20 | 379.6 | 198.0 | 214.6 | 224.5 |
| Yellow pine flooring, mills | Feb., '20 | 455.3 | 184.8 | 205.8 | 189.1 |
| Plate glass, New York | Aug., '20 | 329.5 | 253.5 | 169.0 | 169.0 |
| Window glass, New York | Aug., '18 | 295.2 | 231.0 | 231.0 | 231.0 |
| Linseed oil, New York | Aug., '19 | 480.4 | 147.2 | 145.0 | 145.0 |
| Putty, New York | Jan., '20 | 226.4 | 179.2 | 179.2 | 179.2 |
| Turpentine, New York | Apr., '20 | 601.8 | 176.4 | 189.3 | 190.2 |
| White lead, New York | Mar., '20 | 229.3 | 181.2 | 181.2 | 181.2 |

Competent authorities express the belief that prices will remain near the present general level for some time. Doubtless prices on those items which still are high may be reduced nearer the general level. These reductions probably will be offset by advances in items such as lumber and steel, so that the general building material index may be expected to remain about as it now is for the next few months. With the opening of the spring season the demand is very apt to strengthen prices and it will not be surprising if there is an appreciable advance in construction costs during the last half of 1922. Substantial freight reductions such are are now advocated by the National Federation of Construction Industries would tend to hold down construction costs, but several very careful students of the price situation have not hesitated to predict higher prices for the latter half of this year.

If the financial situation were easier, one would be justified in saying, without reservation, that current conditions are more favorable to building projects than will be the conditions prevailing six months from now, when the market is more active. The cost of financing, however, still is high. In many localities it is too high to warrant investment and industrial building. It is assumed, however, that the hospital or institutional building project has accumulated its building fund before coming to a decision to build. In such instances where the necessary funds are available, no unusual hazards will be encountered if the project is put under way at once. Immediate action will enable the builders to make the most of a labor market which permits of discrimination in the labor hired; it will take advantage of an abundance of all materials and the project is likely to be finished before competition for labor and materials tends to force up the ultimate cost of construction.

Turning from the general construction field to the division of hospitals and institutions, there is evidence that this type of building has been subnormal, especially in the New England States, the South and the far West. The F. W. Dodge Company statistics show the followlowing for building contracts actually awarded during the years indicated:

### For Hospitals and Sanatoriums

| District | 1919 No. | 1919 Cost | 1920 No. | 1920 Cost | 1921 No. | 1921 Cost |
|---|---|---|---|---|---|---|
| Boston | 73 | $ 3,093,442 | 45 | $ 3,310,300 | 57 | $ 6,819,200 |
| New York | 99 | 11,819,605 | 122 | 9,811,700 | 92 | 7,785,800 |
| Philadelphia | 77 | 3,908,800 | 60 | 4,597,400 | 81 | 7,581,500 |
| Pittsburgh | 27 | 816,100 | 56 | 7,693,800 | 70 | 8,358,700 |
| Chicago | 132 | 9,929,035 | 121 | 14,968,100 | 111 | 14,985,800 |
| Minneapolis | 23 | 2,442,800 | 25 | 1,417,100 | 18 | 3,470,000 |
| Total | 431 | $32,009,782 | 429 | $41,798,400 | 429 | $49,001,000 |

### For Homes and Institutions

| District | 1919 No. | 1919 Cost | 1920 No. | 1920 Cost | 1921 No. | 1921 Cost |
|---|---|---|---|---|---|---|
| Boston | 17 | $ 569,400 | 20 | $1,014,100 | 20 | $ 885,700 |
| New York | 36 | 1,549,546 | 40 | 2,982,400 | 36 | 5,655,500 |
| Philadelphia | 22 | 544,500 | 34 | 1,197,700 | 41 | 1,295,500 |
| Pittsburgh | 24 | 2,522,800 | 21 | 1,335,500 | 32 | 1,758,900 |
| Chicago | 45 | 1,779,595 | 33 | 1,691,000 | 43 | 4,935,800 |
| Minneapolis | 7 | 216,000 | 11 | 523,700 | 6 | 219,000 |
| Total | 151 | $7,181,841 | 159 | $8,774,400 | 178 | $14,750,400 |

Projects reported as contemplated during 1921 (figures for December not included) show the following:

### Contemplated Projects in 1921

| District | Hospitals and Sanatoriums No. | Hospitals and Sanatoriums Cost | Homes and Institutions No. | Homes and Institutions Cost |
|---|---|---|---|---|
| Boston | 93 | $ 9,283,300 | 42 | $ 2,179,800 |
| New York | 173 | 7,336,800 | 59 | 3,426,300 |
| Philadelphia | 149 | 13,897,000 | 70 | 4,308,800 |
| Pittsburgh | 97 | 9,426,200 | 42 | 2,450,900 |
| Chicago | 220 | 32,208,600 | 93 | 9,693,000 |
| Minneapolis | 41 | 3,657,500 | 18 | 790,000 |
| Total | 773 | $75,809,400 | 324 | $22,848,800 |

In studying these figures it is well to have in mind that they are for the territory north of the Ohio and east of the Missouri rivers and that the cities named include much adjacent territory rather than the city proper.

During the past three years (January 1, 1919, to December 1, 1921) the amount of contemplated work reported in the hospital and institution group for the entire Dodge territory has been $288,000,000. The normal amount of work actually constructed in the same period, approximately two-thirds of the total contemplated work, should have been $192,000,000, whereas the actual construction has amounted to $153,328,000. Although this class of construction has shown an increase in 1921, these figures seem to indicate that there is still work of this class held up which may be expected to go ahead in the future. This is accumulated demand and will, of course, augment the current or normal requirements of the year.

## GRACE HOSPITAL REDUCES RATES

A reduction of twenty-five per cent in rates of the x-ray laboratory and surgical department was made by the Grace Hospital of Detroit on February 1. On the recommendation of the superintendent, the board ordered these reductions of rates which were raised during the war and post-war periods in order to meet current expenses.

## CARE OF EPILEPTICS AT CRAIG COLONY

While general rules may be laid down in regard to the care of epileptics as well as of others suffering with nervous disorders, it is especially important that this particular class of patients should have its treatment based upon the most careful analysis, say the managers and officers of Craig Colony at Sonyea, N. Y., in their latest annual report to the legislature of that state. The arousing and sustaining of the patient's interest and the affording of proper energy outlets should be essentials in prescribing treatment, the report brings out, it being remembered that the epileptic does not differ materially from other persons.

In the last analysis, says the Craig Colony board, one must admit that the essential feature in the treatment of epilepsy is a thorough understanding on the part of the patient of what obstacles he must overcome and in what way he lacks power to meet many of the situations occurring from day to day. The individual patient must be possessed of sufficiently normal mentality to permit of participation in free discussions as often as may be needed in regard to his treatment, both physical and mental. As it may be necessary to attempt a complete rearrangement of the habits and mode of life of the patient, it is easily understood how difficult a satisfactory solution of his problem may be. The goal sought should be to arouse healthy interests in the patient and thus effect a new viewpoint of life and a healthier way of meeting its problems. The majority of epileptics must pursue a mode of life which makes less insistent demands upon them than are made upon healthy individuals.

An occupation in which the patient is interested and which permits of a sufficient amount of physical and mental exercise will prove beneficial, the report continues. Unfortunately, it reads, many are averse to attempting such a course either because of their faulty mental habits, or oftentimes because of improper advice from relatives and friends. The following of an occupation in which the patient is interested, with allowance for recreation, regard for simple hygienic rules and reasonable diet, will go a long way toward benefiting the patient who at first may present a most discouraging prognosis.

## NAME IS MISSPELLED

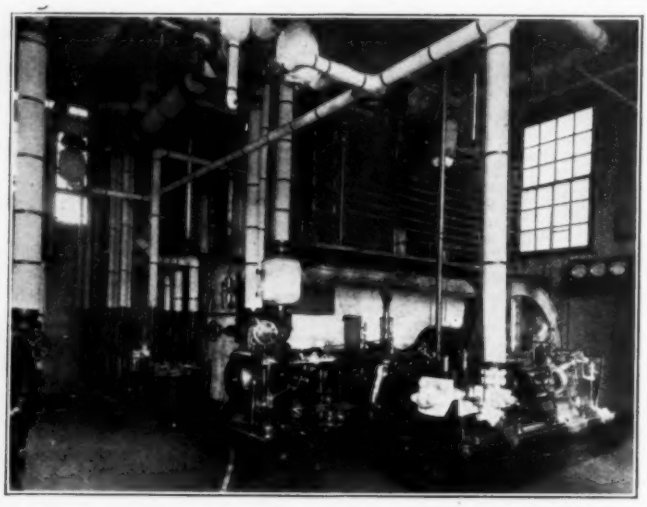
Through an error which THE MODERN HOSPITAL deplores, the name of Dr. Frank P. Corrigan, appearing in the article on "The Hospital Situation in South America," in the January issue, was incorrectly spelled.

# MECHANICAL REFRIGERATION AND ITS USE IN THE HOSPITAL

By JOHN DUTCHER, Mechanical Engineer, of Richard E. Schmidt, Garden & Martin, Architects, Chicago

REFRIGERATION, the extraction of heat from any substance, is accomplished by the simplest natural laws. It takes five times as much heat to vaporize water as it does to bring it to the boiling point. The simplest refrigerating machines are the porous jars with thin walls used to keep water cool. In these the water oozes through the pores and evaporates on reaching the outer surface. The amount evaporated is comparatively small, but the amount of heat required is large; it is extracted from the water remaining in the jar.

Refrigeration on a larger scale follows the same natural law or principle that the expansion of liquid into vapor is accompanied by the absorption of heat from surrounding objects. The unit or measure of refrigeration is called the ton. It is the heat required to melt one ton (2,000 pounds) of pure solid ice or the heat absorbed by 2,000 pounds of pure ice melting into water at 32 degrees F. and is generally calculated on a twenty-four hour basis.



20-Ton Refrigerating Machine at the Illinois Central Hospital, Chicago

The expansion from a liquid into a gas is accomplished by raising the temperature of that liquid above the boiling point. In order to freeze ice it is necessary to use a liquid that has a boiling point below 32 degrees F.; anhydrous ammonia or carbonic acid gas ($CO_2$) are most generally used.

Mechanical refrigerating on any scale depends upon the expansion of a liquid into a gas, accompanied by the absorption of heat from the surrounding objects. The gas is expanded into pipe coils called expansion or cooling coils. The compressor sucks the expanded gas from these coils and compresses it under considerable pressure. The gas leaves the compressor quite warm and is discharged into a condenser, where the pipes containing the hot gas are submerged or brought into contact with cool water. The pressure of the gas builds up and is cooled by the water until the gas liquefies. From the condenser the liquid is collected into a receiver and is conveyed to the expansion or cooling coils, where it is again expanded into a gas. The same charge of gas is used over and over. Its replacement is caused by small leakages at valve stuffing boxes and at the packing on piston rod and gaskets.

The water flowing over the condenser is a very important link in the process. As it leaves the condenser the water is 10 or 15 degrees warmer than when it entered. From this it can be seen that the heat taken up by the water closely represents the amount of cooling done by the expansion coils. In case the cost of water is low, it can be wasted to the sewer, but where water is scarce or expensive it will be found advisable to run the water leaving the condenser in a cooling tower or spray pond. Fig. 1 represents a refrigerating plant diagramatically, the refrigerant gas forming one complete cycle. The cooling water on the condenser and the spray pond forms a complete cycle of heat absorption at the condenser, and heat dissipation by evaporation at the spray pond is similar to the evaporation on the surface of the porous earthen jar.

The machines most commonly used in mechanical refrigeration in the hospital work on what is generally termed the compression system. This consists of a gas compressor or pump driven by steam engine or motor. Choice between motor or engine depends largely upon local conditions. As a general thing, a steam engine is used in units of considerable size, especially where use can be made of the exhaust steam for the heating system or for heating water for domestic purposes. The steam driven unit will prove the most economical in the majority of hospitals. Where the cost of current is low, the electrically driven compressor can be used. There has been considerable development in refrigerating machines automatically controlled. Such improvements have proved quite satisfactory in the case of elec-

trically driven units. The motor is stopped and started by special thermostats regulated by the temperature in the boxes to be cooled. Special control valves to turn on or off the condensor water are available to work in conjunction with the automatic control machine. Also it is possible to use temperature control valves on the outlet from the condenser that will regulate the flow of water and allow any water of a certain predetermined temperature to escape. This feature takes from the engineer the necessity of regulating by hand the amount of water used and results in considerable saving.

On an installation which contains several boxes distributed in various portions of the building, the automatic control refrigerating system is practically eliminated for the reason that it can control temperature in one box only.

Anhydrous ammonia and carbonic anhydride, generally known as carbonic gas ($CO_2$), are the refrigerating mediums most commonly used. The ammonia machines operate under considerable less pressure than the $CO_2$ compressor, and they have been in general use for a good many years. They are built in many styles, single acting, double acting, vertical or horizontal. Carbonic gas machines have to withstand considerably greater pressure and the gauges for these machines are generally calibrated in atmospheres rather than pounds. This high pressure makes it necessary for the manufacturer to design special stuffing boxes to withstand this pressure and to provide special lubrication for these stuffing boxes.

The stuffing box is one of the critical considerations in selecting carbonic gas machines. The efficiency of the gas compressor depends largely upon very small clearances at the end of the cylinder and the suction and discharge valve openings; in selecting a compressor the amount of clearance should be looked into carefully. Of the two gases above mentioned, the carbonic acid gas is the odorless one, and where it is necessary to install refrigerating machines in the basement of the hospital building, this type of machine should preferably be used. In hospitals that have detached power houses, an ammonia compressor can be installed in perfect safety and is perhaps the cheaper of the two.

## Suggestions on Brine Coolers

The brine cooler preferably should be located close to the machine, so that there will be short pipe connections between the compressor, condenser liquid receiver and expansion coils. In the average sized hospital, where only a small amount of ice is required per day, the brine cooler can be combined with an ice freezing tank, similar to the one shown in Fig. 2. The cooling of the brine in this tank is accomplished by evaporating ammonia or carbonic acid gas in the pipes. The size of the ice cans should preferably be small, not over 100 pounds, which would be approximately 8″x16″x32″. Expansion coils in a tank of this sort should be of the continuous welded type, having as few joints as possible and being distributed uniformly over the entire area of the tank, by this method eliminating the necessity of special brine circulating pumps or agitators. It would be more economical to add a few extra cans in the tank and allow a longer period for freezing rather than to install a brine agitator which would require power to operate it. One end or side of the brine tank should have a partition arranged to maintain a constant level of the brine around the ice cans. Calcium chloride brine should preferably be used, and maintained at specific gravity of 1,250 Baumé.

## Refrigerator Coils Cooled Best by Brine

Coils for cooling the refrigerator boxes can be cooled by either direct expansion or by brine from the brine cooler. In hospital work it is preferable for many reasons to use the brine system for cooling. This is accomplished by connecting the suction of a small pump to the brine tank and circulating brine from the discharge of the pump through the brine supply line to the various refrigerating coils. The return brine lines following the supply lines bring the warm brine back to the brine cooler to be re-cooled. By installing shutoff valves on each refrigerator box, the amount of brine flowing through the coil into the box can be regulated and the temperature of the individual boxes controlled accordingly. Care should be taken, however, to have large valves which will not stop up. The valves should clear themselves by opening wide to allow the required amount of brine to pass, and reclosing. Valves for each refrigerator should preferably be locked in a separate compartment, so that only one man can be held responsible for the regulation of the temperature in the boxes; this man should keep a daily report of the temperature in each refrigerator throughout the hospital.

In close proximity to the brine cooling and ice freezing tank, an ice storage room should be provided large enough to contain several days' supply of ice. One hundred pound cans of ice can be lifted with a small hand-operated ice hoist and truck and taken to the ice thawing apparatus; this apparatus should consist of a tilting galvanized iron container, large enough to hold one ice can, mounted on a steel pan so that hot water can be discharged over the can to loosen the cake of ice. Special care should be taken that this thawing dump be properly drained so as to allow

none of the water to splash into the brine tank and dilute the brine.

### Drinking Water Coolers

To cool water for drinking purposes, special coolers should be located close to the brine tank. Coils for circulating brine in the drinking water cooler can be connected to the brine circulating system and controlled by valves similar to those described for each refrigerator. These brine coils should be divided into three sections, so that the engineer can control the temperature of the water to any desired degree by turning on or off some of the brine cooling surface. The drinking water cooler should be designed both to cool the water from the temperature of the make-up water and to recool the recirculating water from the system. The drinking water system proper should be circulated by a small pump which would discharge the water through the lines to the various drinking fountains. The return circulation from this line should follow the discharge line from the building and return the circulating water to the cooler for recooling. It is generally advisable to install in the highest point of the building an air eliminating tank to which the top of all drinking water risers are connected. The connection to each individual drinking fountain should be taken off of the riser at a point two feet higher than the outlet of the fountain. This branch connection must be carried down adjacent to the riser and be provided with a control valve to regulate the amount of water at each individual fountain. By making this connection as described, it is possible to eliminate the very annoying discharge of air through the fountain. Persons at the drinking fountain not infrequently have water and air spattered up into their faces because air has entered the fountain with the water. By thus eliminating the air and providing a uniform flow of cool water to the fountains a considerable saving in refrigeration can be made.

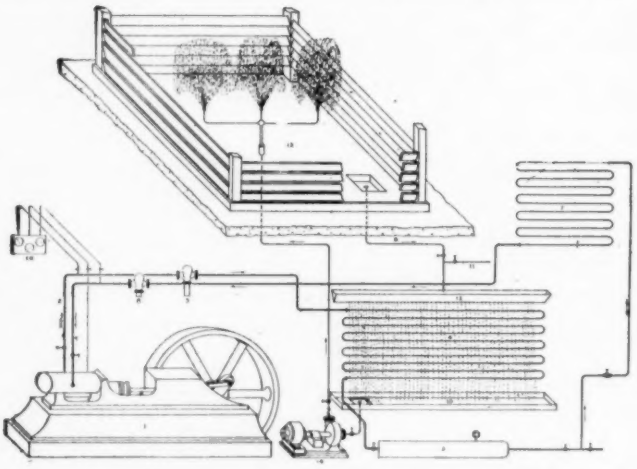


Fig. 1. DIAGRAMATIC R :FRIGERATION PLANT.

1. Compressor.
2. Discharge pipe.
3. Oil trap.
4. Condenser.
5. Liquid receiver.
6. Expansion valve.
7. Cooling coils.
8. Scale trap.
9. Suction pipe.
10. Gauges.
11. Water supply.
12. Trough.
13. Pan.
14. Circulating pump.
15. Spray pond.

The cycle of refrigerant can be :ollowed as well as the course of the condensing water.

### Advantages Over Ice Refrigeration

The advantages of mechanical refrigeration over cooling by ice are a marked improvement in keeping the boxes clean and in a sanitary condition. The temperature of the various boxes can be varied to meet any requirements, there is no messing of the floors due to drippings from the ice, and the boxes are a great deal dryer.

When used in the main kitchen, several boxes are installed, in order to preserve the food better, such as one for meats, one for vegetables, one for milk and dairy products, and one for fish. Smaller refrigerators are used in the serving rooms for prepared food and in the laboratories for preserving and freezing specimens for sectional work.

Ice is made by this machinery for table use, ice packs, ice cream freezing, and cooling drinking water. Mechanical refrigeration is also employed for cooling morgue body cases and in special rooms for storing garbage until it can be properly disposed of.

The following figures indicate the pounds of ice used per day during summer and winter in several Chicago hospitals; and also the quantity used per patient per day. These hospitals have mechanical refrigerating machinery and the quantities set forth represent the amount of ice made and used for ice packs, table and other purposes:

| *Hospital* | *Winter* | *Summer* | *Beds* |
|---|---|---|---|
| Illinois Central..... | 300 lbs. | 500 lbs. | 115 |
| Chicago Lying-In ..... | 750 lbs. | 1,000 lbs. | 128 |
| Alexian Brothers..... | 230 lbs. | 420 lbs. | 363 |
| Grant, daily average for year, 1,000 lbs. | | | 150 |

*ICE PER PATIENT PER DAY*

| | *Winter* | *Summer* |
|---|---|---|
| Illinois Central ..... | 2.6 | 4.35 |
| Chicago Lying-In ..... | 5.85 | 7.8 |
| Alexian Brothers ..... | .6 | 1.1 |

Grant, daily average for year, 6.67.

In choosing between an ammonia or $CO_2$ machine there is but little difference where cool condenser water is available. When the condenser water goes over 70 degrees F. the ammonia machine should be given the preference. In comparing the two machines with the boiling of the refrigerant at 10 degrees F., the increased horsepower required per ton of refrigeration by increasing the condenser water from 70 degrees F. to 80 degrees F. would, with the ammonia machine, amount to two, while in the case of the $CO_2$ machine the increase would be three.

Where direct expansion is used over a large area requiring a number of coils, ammonia has the advantage over the $CO_2$. The cost of replacement of gas is likely to be smaller for the ammonia machine, because it is hard to detect leakage in the $CO_2$ system. Advantages in favor of the $CO_2$ system are that the gas is odorless, noncorrosive (which allows the use of copper condenser coils), and non-explosive.

## Cork Is Best Insulation Material

Insulation is a material, or arrangement of material, that is a non-conductor of heat. It is one of the most important items to be considered in mechanical refrigeration. Without it the cold brine lines leading to the various boxes could not be protected, or without insulation in the boxes themselves there would be no common refrigerating box. No one would think of running electric wires without a good rubber covering on them; special rules and laws require a fair degree of protection. In the case of refrigerating, however, the insulation on the system is not restricted to any rule or law, and it is up to the engineer to design a system that is economical. It is possible to have a refrigerating system that is practically all wasted, due to poor insulation; the results would be more expensive and less efficient than could be accomplished by using ice.

Cork is the best insulation on the market; it is not affected by moisture. For such uses the natural cork is broken up into fairly small pieces and is known as granulated cork. Granulated cork can be moulded into metal moulds of any desired shape; by applying pressure and heat the natural gum and resin contained in the cork binds the particles into what is known as cork board, and in this shape it is the best form of insulation on the market. The binding together of granulated cork by the use of some foreign material does not give results to compare with the work of its own gums and resins. In building up a large refrigerator or in installing a large brine tank or cold storage room, two or more layers of cork board are generally applied. Layers should also be applied in such a way that all joints are broken; best results are obtained by using hot asphalt in the application of the cork boards. In some cases Portland cement is used in place of asphalt to cement the layers together, but it is doubtful if the results are equal to the hot asphalt process.

## Covering the Pipes

The insulation of the brine tank under temperatures generally used should consist of five inches of pure cork board, consisting of one three-inch layer and one two-inch layer laid in hot asphalt, with broken joints. This insulation should be protected from abrasion by being enclosed in tongue and grooved sheathing or tile furring and cement plaster.

All brine pipes and exposed suction lines to the refrigerating machines should be covered with standard thickness moulded cork, having a thickness corresponding with the following:

*STANDARD CORK BRINE COVERING*

| *Pipe Size* (both in inches) | *Thickness* | *Pipe Side* (both in inches) | *Thickness* |
|---|---|---|---|
| ⅜ | 1.78 | 2½ | 2.56 |
| ½ | 1.70 | 3 | 2.68 |
| ¾ | 1.85 | 3½ | 2.81 |
| 1 | 2.00 | 4 | 2.56 |
| 1¼ | 2.32 | 4½ | 3.06 |
| 1½ | 2.50 | 5 | 2.78 |
| 2 | 2.44 | 6 | 3.12 |

In applying the covering, all foreign material, such as plaster and plaster cement, should be removed from the surface of the pipes and from the inside of the covering before it is applied. All end joints should be staggered by cutting one-half of the first section of covering and leaving the other half full length. All longitudinal joints should be preferably on the top and bottom, not on the sides. Covering should be applied on all joints with special waterproof cement and should be held securely in place by copper-clad steel wire, using not less than six bands to a section of covering. Care should be taken to see that all the binding wires are drawn tightly. All space between the covering and the pipe and between each section of covering should be filled with a special

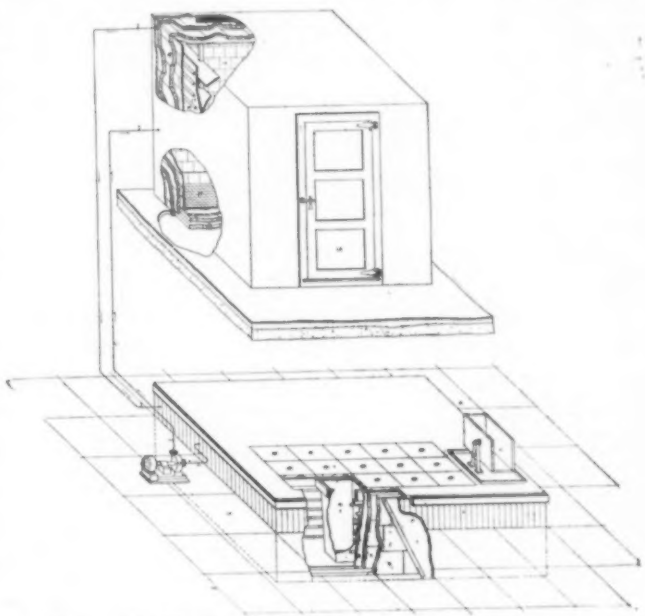


Fig. 2. DIAGRAM OF ICE TANK AND REFRIGERATOR.

1. Brine tank top.
2. Ice can.
3. Ice can top.
4. Expansion coils.
5. Steel tank.
6. Cork insulation.
7. Asphalt saturated felt.
8. Tank enclosure.
9. Ice dump.
10. Floor.
11. Brine suction.
12. Brine circulation pump.
13. Brine discharge.
14. Cooling coils.
15. Baffle.
16. Tile wall.
17. Tile floor.
18. Refrigerator door.
19. Return brine.

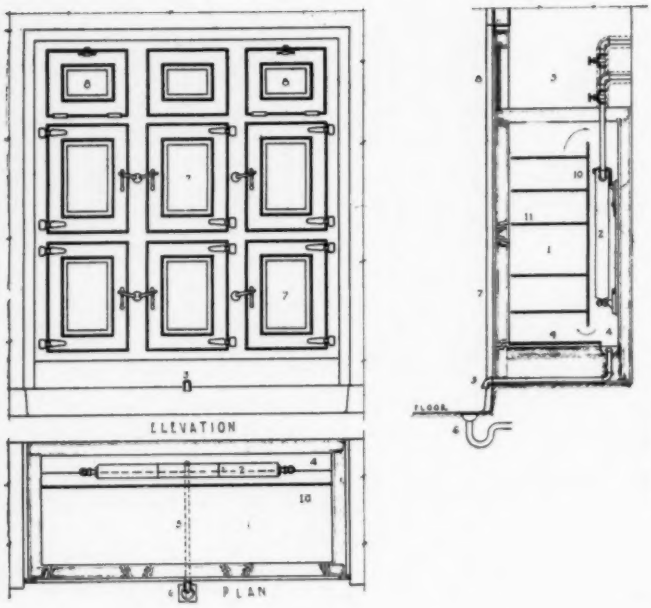



Fig. 3. SMALL REFRIGERATOR BOX.

1. Provision chamber.
2. Cooling sections.
3. Valve chamber.
4. Drip pan.
5. Drip pipe.
6. Refrigerator drain.
7. Refrigerator door.
8. Valve chamber door.
9. Tile floor.
10. Baffle.
11. Porcelain enamel shelves.

waterproof cement made for this purpose. Where brine lines pass through tunnels or pipe spaces and where the temperature is quite warm, it is advisable to protect these lines in such a way that the waterproof cement cannot drop out or flow at times when the lines are shut off, for heat softens the cement. This can be accomplished by wrapping all pipes with two heavy layers of resin finished paper, over which a canvas jacket is applied. The canvas jacket should be of at least six-ounce canvas, lapped and pasted, and in addition it should be banded with standard pipe bands spaced not farther than 18 inches apart. The covering of drinking water lines should be preferably cork of the same quality applied in the same manner as described for brine lines; in view of the lesser difference in temperature between the water in the pipes and the surrounding air in this case, it is frequently not done. The thickness of the covering should be as indicated in the following table:

*ICE WATER PIPE COVERING*

| *Pipe Size* (both in inches) | *Thickness* | *Pipe Side* (both in inches) | *Thickness* |
|---|---|---|---|
| ⅜ | 1.28 | 1½ | 1.42 |
| ½ | 1.20½ | 2 | 1.47 |
| ¾ | 1.35 | 2½ | 1.37 |
| 1 | 1.47 | 3 | 1.56 |
| 1¼ | 1.48 | 3½ | 1.62 |

There are on the market many makes and varieties of insulation; in any case, it can be safely said that they are a substitute for cork. Cork, as has been said, is not affected by moisture. In a great many cases built-up insulation, consisting of lumber, tar paper and air spaces, depending upon the air space being air tight for insulation, are used; other arrangements include the use of fibrous material of some sort, such as sawdust, mineral wool or flax with hemp wastes, in place of cork; but in every case, whenever these materials become damp, they lose their insulation qualities. In a refrigerating box where the temperature on the inside is cold and where there is an outside temperature of 70 or 75 degrees, the hot air contains a great deal more moisture than the cool air; moist air, then, in coming in contact with the cool surface of the refrigerator or the insulation, drops its moisture because the dew point is lowered, moistens the insulation, and the insulation becomes a conductor rather than an insulator.

## Local Conditions Will Govern Design

Definite figures are liable to mislead in the designing of a refrigerating plant, and it is best not to try to explain the size and length of coils, the size of condenser, etc. They vary with every job, due to local conditions, and it can be said that refrigeration, although it follows simple natural laws, is dependent upon conditions that are variable with the season. A plant that is arranged to suit one community would be of little use in another. The amount of cooling accomplished in the condenser depends upon the surface and the temperature of the water going over it or in contact with it, and in a great many communities the water available for the condenser is considerably warmer in the summer time when the load is large than in the winter when the load is small. In the case of refrigerating boxes, the amount of coils largely depends upon the quality of the insulation in the boxes, and upon the amount of frost allowed to accumulate on the coils, which acts as an insulation and decreases their efficiency. This can cut down the efficiency of the coils approximately fifty per cent. The capacity of a refrigerating machine itself, which as a pump displaces a certain amount of gas or rather cubical contents per minute, is a varying quantity dependent upon the suction pressure under which the machine is operated. For instance, the same machine working under a low back pressure will do less refrigerating than the same machine working under high suction pressure; likewise, the power varies with the work done. In hospital refrigerating, the majority of the work done does not require low temperature and in special cases, such as the laboratory where special samples are to be frozen to a low temperature, it would be advisable to use a small booster machine that would operate on a low suction; this gives in turn a low temperature, discharging the refrigerant into the suction pipes of the general sys-

tem. From the above it can be seen that the varying temperature of water in condensers, varying efficiency in the cooling coils and the varying amount of refrigerating effect due to fluctuations in the suction pressure make for a varying condition in refrigeration. It is therefore an essential matter to design and so proportion an installation that it will coordinate with local conditions. The only real way of rating a plant is that it be equal to the melting capacity of so many tons of ice at 32 degrees.

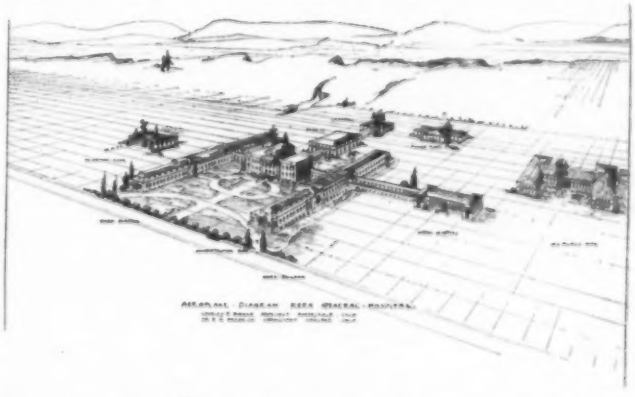
### Engineer Is Often at Fault

The engineer is in a great many cases not fully familiar with the operation of a refrigerating plant. He operates the plan by maintaining a certain pressure on the suction and a nearly constant pressure on the discharge, such as he thinks is best suited for his plant. The result is that in many cases the refrigerating apparatus is operating inefficiently. The chances are that the engineer will insist on having the suction line frost back very heavily in order to keep the machine cool; some engineers will insist that this is the only way to keep the stuffing box on the rods tight. The leakage around the stuffing box is in most cases caused by changes in temperature. If the engineer can understand really what is going on in the machine he is operating, it would be a great aid to him in running it efficiently. When he realizes that refrigeration depends upon two things, temperature and pressure, it will be easier for him to grasp what is essential.

There is no such thing as cold. Cold is simply the absence of heat, and when we say anything is cold, we are comparing it with some other normal temperature. Every substance contains some heat, if it is above the temperature of 460 degrees below zero F. Heat is indestructible and can only be converted into work or stored up in chemical form. Unless changed into work it will remain in a given substance until it flows into a substance at a lower temperature. This can be compared to the flow of water from a reservoir. The water will flow from the high to the low level, and the greater the height of the reservoir the more rapid will be the flow. It is the same with heat. When two materials of different temperature are in contact, the heat will flow from the one having the higher temperature to the one having the lower temperature. The temperature of the heat in a gas is increased by increasing the pressure, and it is upon this principle that refrigeration is based. Because we cannot destroy heat, we are able to figure out size and quantities in designing a refrigerating plant. In order to cool water or the interior of refrigerator boxes, we must have a substance of a lower temperature so that the heat will flow from the water or the refrigerator to the material having a lower temperature.

In other words, the whole process of refrigerating is based on the handling of heat, controlling of temperatures, and the fact that the pressures under working conditions are determined by the temperature. For this reason the control of refrigeration should be accomplished by the control of temperature and not of pressure.

The amount of heat that a pound of ammonia can absorb depends upon the temperature at which the evaporation takes place and the temperature of the liquid ammonia introduced into the expansion coil. For instance, if the evaporation takes place at zero degree F. and the temperature of the liquid entering the evaporating coil is 90 degrees F., the amount of heat which one pound of ammonia will absorb by expanding from liquid at 90 degrees F. to a gas at zero degrees F. is 469 B. T. U.; the work done by the compressor depends upon the number of pounds of ammonia handled, for the higher the pressure in the expanding coils and the lower the temperature of gas handled, the more pounds of ammonia will go through the cycle, and the more pounds of ammonia handled by the machine per minute, the more work is being done. The temperature of ammonia leaving the condenser should correspond to the saturated pressure, and where condensing surfaces are well proportioned should not exceed by more than 10 degrees the temperature of the water leaving the condenser. The difference of temperature of gas leaving the evaporating coils and that entering the compressor should not be more than a few degrees. The temperature of the gas leaving the compressor should be close to what is required for compression; if it is exceptionally high, the high temperature is prob-



Situated on Kern Mesa, 150 feet above the river, with a pleasant valley in front and snow-capped mountains in the rear, is the new Kern Hospital Group at Bakersfield, Cal., now in process of construction. The new hospital will consist of a two-story central building with a service building behind, men's ward building to the west and women's building to the east. A central heating plant, nurses' home, detention home for fifty boys and girls, and an old people's home for sixty, are included in the present layout. The structures will be of brick and terra cotta with tile roofs. Charles H. Biggar of Bakersfield, is the architect and Dr. R. G. Brodrick, of Oakland, consultant.

ably caused by leaky piston rings or a wire drawing through valves that are too small.

In the case of ammonia machines, if operating under a suction pressure of 15 pounds, a pound of liquid ammonia, when expanded into gas, occupies approximately nine cubic feet; if this nine cubic feet of ammonia is expanded on its way to the compressor so that it occupies twelve cubic feet, the compressor will be obliged to run one-third faster or be made one-third larger in order to handle one pound of ammonia at the same rate. Great care should be taken that the ammonia entering the suction of the refrigerating machine should not contain an excessive amount of unexpanded liquid. The liquid or unexpanded ammonia when entering the hot cylinders expands rapidly and by the time it is compressed is expanded into gas. This ammonia has not done useful work, and has reduced the efficiency and output of the machine materially. A machine working under this condition is operating on what is commonly termed "wet compression," and in many cases small plants are operated under a condition in which so much unexpanded ammonia is entering the compressor that the output is reduced to practically nothing. According to recent tables of a test made by the York Manufacturing Company, a machine working under a suction pressure of fifteen pounds, and discharging against a condenser pressure of 185 pounds, increased its output from twelve and one-half tons to twenty-sx tons when the discharge temperature was increased from ninety-five degrees to 243 degrees. The engineer should know the essential elements on which refrigeration is based, and if he keeps them in mind he will be able to operate the plant efficiently and give real results.

Those not conversant with refrigerating matters like to see ice on the coils in refrigerators and apparently think that it helps refrigeration. This view, however, is incorrect. Ice and frost insulate the coils, reduce their efficiency and, if the ice is allowed to form heavily, sometimes cracks pipes or fittings. Frost and ice on coils are produced when the doors are left open and brine is circulating through the coils.

The doors should always be kept closed, but if ice is formed on the coils the brine should be shut off, the contents of the refrigerator removed, the doors opened and left open until the room temperature has melted the ice and frost.

We have in the Adirondack mountains of New York, and various sections of the western part of the United States, famous health centers for the cure of lung and throat trouble. The dry air, or low relative humidity, aids the sufferer. The dry regions are generally surrounded by mountains of considerable altitude. It is on these mountains that the moisture laden air from the lower levels is cooled and drops its moisture, allowing only the dry air to reach the valleys beyond. This cool, dry air is warmed and expanded by the heat of the sun and is nature's best climate for certain ailments.

Manufactured weather is a reality today, made possible by mechanical refrigeration. Washed air is cooled by cooling coils until it drops its moisture. The cool, dry air is then reheated by steam coils and we have perfect air the year around. The doctor can prescribe any degree of humidity best suited for his patient. This manufactured weather will be constant and will eliminate the moist air during rain, dust or sand storms that occur at intervals in the best climates. Manufactured weather is being used quite extensively in factories where constant weather is required to turn out a uniform product, and as a by-product it has increased the output by increasing the comfort of the workers. Where power is cheap or ample funds available we may look for special hospitals to have special air conditioned weather throughout the year.

## INTERNATIONALIZING SERA STANDARDS

Cooperation of the foremost laboratories of the world, including those of United States, for the unification of international standards of anti-toxic sera has been begun on a large scale by the League of Nations Health Committee, according to detailed plans received here today. Already two preparatory conferences have been held, the work divided among the various national laboratories, and the individual studies begun.

The work involved is considered of great importance to the medical world. Up to now there has been as much confusion in the various national standards of measuring the strength of anti-toxic sera for diseases such as dysentery, tetanus, diphtheria, syphilis, meningococcus and pneumococcus as there has been in the different currency systems in the world.

This has had two serious effects. First, the American scientist, for instance, is handicapped in studying methods of treatment of various vital diseases abroad because of the different standards of measuring the strength of the anti-toxic sera employed; secondly, as international trade in sera is increasing, it represents not only an inconvenience, but a positive danger to have their strengths listed at varying standards.

Other bodies besides the U. S. Public Health Service which will cooperate in the work are the Medical Research Council of Great Britain, Pasteur Institute of France, State Institute of Italy, State Institute of Warsaw, Hygienic Institute of Basle, Pasteur Institute of Brussels, Kitasato Institute of Japan, as well as Austrian and German organizations.

## ANESTHETISTS PLAN WORLD CONFERENCE

The World Congress of Anesthetists is to be held in Columbus, Ohio, on the tentative dates of October 31 and November 1, it is announced. Invitations are being forwarded by the National Anesthesia Research Society to anesthetists in many foreign countries and a large attendance is expected from the United States and Canada.

# PAINTS AND VARNISHES IN THE HOSPITAL

By C. E. O'HARA, Chicago

FROM the standpoint of sanitation the pigment and vehicle which constitute the paint or enamel product determine the resistance of the paint film toward harboring bacteria in quarters now or previously occupied by persons suffering from contagious disease. The pigment and vehicle also determine the extent of the absorption of dirt into the paint or enamel film and its receptiveness and retention of dust.

The serviceability of the finished surface on walls, ceilings, floors and fixtures in hospitals is very important. The finished surface, of course, must be one that can be frequently washed, as it is necessary to maintain sanitary conditions throughout the buildings.

Careful selection of color for walls and ceilings from operating room to kitchen should be made. Proper choice of color insures maximum efficiency of the physician, surgeon, nurse, housekeeper and chef, owing to its light reflective factors. Color, too, has a definite relation to the patient's mood. Light tints in proper harmony are restful; restfulness is conducive to happiness and amiability, and they, of course, stimulate convalescence.

The architect who is selected to prepare the plans and specifications of the hospital is obviously the one who should first be consulted relative to interior finishes. He, in turn, should consult with competent master painters before specifying the material to be used, the colors to be selected and the procedure of application. In this brief article we shall endeavor to present helpful suggestions relative to the finishes for hospitals and the care of wall surfaces.

Alameda County Hospital at San Leandro, Cal., has just opened a new Employes' Building, erected at a cost of $78,000. Each employe has a separate room in the wings, and in the center are provided a library, writing room, billiard and recreation rooms.

In the majority of the present day operating rooms the finish is of encaustic tiling. This fact, we believe, is responsible for the specifying of the glazed white finish in operating rooms of all old hospitals, when refinishing is in order, and in new hospitals not equipped with tile operating rooms.

The only objection to the glazed white finish of the operating room is based on the complaint of surgeons who claim that this finish develops nerve fatigue caused by the over-strain of the accommodative and visual capacities of the eye in trying to keep out the light rays from every direction. This objection to tile or even an enamel of high gloss finish can be eliminated to a great extent by the use of ground glass windows, or by the use of a semi-gloss or flat white enamel. That this subject of high gloss is well worthy of far more consideration than it has received in the past has been emphasized by Dr. Harry M. Sherman, of the San Francisco Polyclinic, who in an article written for the *California State Journal of Medicine*, sets forth his actual experience in an operating room in which the lower walls and floor were finished with a spinach green enamel to prevent the bright daylight from being reflected upward into the eyes. This, however, is an advanced idea, and we do not believe acceptable to the average hospital without modification.

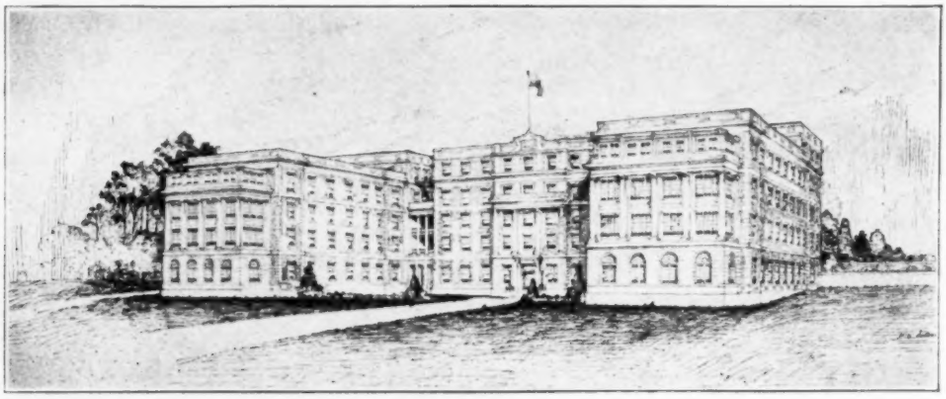
The operating room should be finished with an enamel. Enamel may be had in gloss white, semi-gloss white, semi-flat white, flat white and tints.

The high gloss enamel is less receptive to dust retention than are the other whites. The reflective factor of flat enamel is greater than that of gloss by five to ten per cent. Light reflected by gloss white is about seventy-five per cent, as against eighty per cent by semi-flat or flat white. A ceiling finished with a cream enamel has a reflective factor of about seventy-three per cent; ivory has about seventy per cent and yellow about sixty-eight per cent.

Enamels, either flat or gloss, have about the same resistance to frequent washings and to the harboring of bacteria; manufacturers of Ripolin enamel guarantee their product to be bacteria-proof.

An architect or master painter can specify the proper preparation of the surface, the necessary sealing coats, the undercoats and the finishing coat for a perfect enamel finish to meet any requirement and condition.

The decorator who knows his business considers the height and dimensions of the rooms and wards, the exposure, the amount of light and the furniture in the room in the selection of colors. Certain colors should never be used in hospitals, ounces. A varnished panel, subjected to the same test, gained only .57 of an ounce per square yard and retained after drying only .32 of an ounce per square yard. An oiled piece of wood gained in weight 23.20 ounces and retained 2.18 ounces.



Proposed Homeopathic Hospital of Providence, R. I. Kendall, Taylor and Company, Architects

as they eat up light and make the room appear dark and depressing. The principal offenders in this class are browns, deep buffs, dull greens, blues, reds and deep tans.

Safe colors to use are those that reflect light and make a room look more cheerful, such as cream, yellow, old gold, ivory and flesh tints.

It has been suggested that the same color should never be used on the walls and on the ceiling of a hospital room or ward, for the reason that during the long hours of his illness the patient requires something to divert his mind, and two colors offer contract. We have heard, for the same reason, the suggestion of a simple stencil border of a color similar to the wall.

We recommend the use of a semi-flat enamel or an oil flat wall finish for rooms and wards; a gloss enamel should never be used there. An enamel is best for water resistance, light reflection, bacteria resistance and service.

The natural floor should be finished with two coats of the best floor varnish on close grained woods and with filler and floor varnish on open grained woods.

## Treatment of Floors and Woodwork

On a wood floor it should be remembered that the varnish used must be tough and elastic and as nearly water resistant as possible. When such a varnish is applied the surface is not only prepared to withstand frequent washing, but the pores and channel-like grain of the wood fiber are filled, thereby eliminating the dust and dirt collecting factor of unfinished floors.

It has been learned by actual test that hard spruce wood, for instance, immersed in water gains in weight per square yard 37.83 ounces, and after drying by a special process retains 1.45

Mr. Henry A. Gardner, from whose book, *Papers on Paint and Varnish*, much of the material for this article has been obtained, says a wood panel one-half an inch thick, when exposed to moisture, may gain ten ounces per square yard in a week; when exposed to water it may gain fifty ounces.

When a wax finish is desired, the wax should be applied to the varnished surface and the floor polished with a waxing brush.

## To Avoid Cement Floor Difficulties

Cement floors are water absorbent and are very retentive of dust and dirt. The surface of all cement floors should be prepared by an application of special cement paint. The proper paint on a cement floor prevents moisture from seeping in; shuts out the action of moisture, gases, steam, etc.; prevents discoloration; and eliminates the disagreeable tendency of the concrete floor to "dust up."

To stain and varnish new woodwork, it is necessary to apply a wood stain of the desired color, and if the wood is open grained, such as ash, oak and chestnut, the surface must be treated with a paste wood filler, using a shade which best matches the shade of the stain.

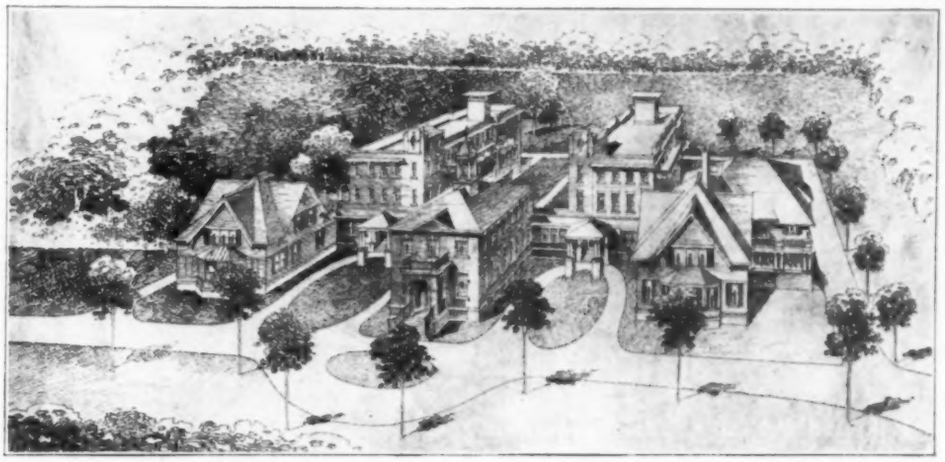
In finishing a natural oak, no stain is used; a light oak paste filler is applied and then varnished or waxed as desired, just as on open grained woods after the filler has been applied over the stain. In finishing close grained woods, such as birch, cypress, basswood and pine, the same directions should be followed except that the paste filler need not be applied.

The modern tendency is to make kitchens in hospitals and homes cheerful, hygienic and sanitary. Paint and varnish are the best germ killers known for general use. Any surface that

acts as a dirt, dust and grease catcher is a germ breeder. Walls and floors should be made washable and sanitary with paint and varnish.

A white kitchen, perhaps, is best of all, but if color is preferred, it is best to choose pale yellow, gray or light green. An oil flat wall finish or an enamel should be used. Either can be kept as spotless and free from dust as marble or tile.

Kitchen floors should be varnished or painted. The best shades for floors are tans, browns and slates, as these colors are easy to keep clean and will save hours of scrubbing.



Proposed Development for Woonsocket Hospital, Woonsocket, R. I. Kendall, Taylor and Company, Architects.

## Some Recipes for Cleaning

The limits of this article do not allow individual reference to the treatment of walls and floors in bathrooms, laboratories, lavatories, clothes closets, radiators, etc., but all of these present interesting problems.

A few suggestions and recipes, relating to the use and care of paints and varnishes in the hospital, are offered in conclusion:

For cleaning and polishing windows, mirrors, glassware:

Mix finest pumice stone in denatured alcohol; apply with a soft sponge, deftly rubbed over the glass, and then wipe off with sponge and water; after this mop the glass with a soft white cotton cloth and finally rub off and polish with a perfectly clean cloth of similar material. Use elbow grease.

For cleaning the painted or enameled surface on walls and ceilings:

Procure some of the finest whiting to be had (precipitated French chalk, entirely free from grit, is best); dip a piece of soft flannel into warm water and squeeze nearly dry; then take up with it as much of the whiting or chalk as will adhere to the flannel and apply it by moderate rubbing to the enameled or painted surface. When this has taken off the dirt and grease, wash the surface well with clear water and rub dry with a soft chamois skin. Before using the cleaning material referred to, care should be taken to have all the surface thoroughly dusted, not neglecting corners and mouldings.

To retain the brightness of a tile floor:

The addition of half a pint of kerosene oil to an ordinary bucket of water will give the best results as to bright appearance when mopping is carefully done; the addition of aqua ammonia and spirits of turpentine, say four tablespoonfuls of the former and two tablespoonfuls of the latter to a three-gallon bucket of water, will leave the tiles clean and bright, even if the mopping is done carelessly. Under no condition should soap or strong soda be used, as that tends to give the tiles an unsightly and dull appearance in a short time.

## DR. SPELMAN TOURO SUPERINTENDENT

Dr. John D. Spelman, former associate director of Mt. Sinai Hospital of Cleveland, has been chosen as the new superintendent of Touro Infirmary at New Orleans to succeed the late Arthur Bramble Tipping. Dr. Spelman has some rather unusual qualifications for the new position.

The new Touro superintendent was graduated in 1911 by the medical department of the University of Cincinnati and served an internship at Jewish Hospital in that city. He took up private practice the year following and shortly after was appointed clinical instructor in medicine at the University of Cincinnati.

In 1915 Dr. Spelman was sent to Belgium by the American Red Cross and served six months under Dr. Anton Depage at LaPanne. Later he returned and saw military service on the Mexican border as captain in the medical corps of the Eleventh Provisional Division. In the World War he was commissioned major in the medical corps in charge of a field hospital. He was promoted to director of field hospitals of the Thirty-seventh Division and was discharged with the rank of lieutenant-colonel.

Upon his return to civil life Dr. Spelman took the course in hospital administration offered by his alma mater under the direction of Dr. A. C. Bachmeyer, superintendent of Cincinnati General Hospital. This course consisted of participation in the work of each department of the Cincinnati General Hospital for variable periods of time, discussion of observations made along with the considerations of accepted methods of meeting similar problems in other institutions, enrollment in established courses in institutional management and similar subjects, and field observations at Cincinnati Tuberculosis Sanatorium, Deaconess Hospital, Christ Hospital, and Good Samaritan Hospital in Cincinnati and the hospitals nearby.

The MODERN HOSPITAL

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## THE SINGLE ROOM HOSPITAL: A COMMENTARY

FURTHER analysis of the proposal that all patients be installed in single rooms and that the open or congregate ward for the care of the sick be abolished is desirable. Whether one approves of the proposal or not, it is reasonable to assume that a demand for so radical a change in hospital practice would never have arisen if unmitigated large wards were perfectly adapted to the care and treatment of all classes and conditions of hospital patients at all times. The value and function of the quiet or separation room has in fact been recognized in hospital literature and practice for considerably more than a generation; but whereas one or perhaps two quiet rooms, attached to a ward unit of twenty-five or thirty beds, were considered sufficient forty years ago, and while twice that number would have been regarded as acceptable twenty years ago, it has remained for hospital idealists of the past decade to voice a demand for a separate room for every patient, regardless of medical or social classification, cost of service or any other consideration.

Those who have participated in the planning, erection and management of hospitals designed in whole or in part for private patients and experienced hospital officials generally, will not, I think, underestimate the values that inhere in single rooms. On the other hand, experience has shown the heavy cost, particularly under the conditions now existing, of that type of construction, and one cannot conscientiously disregard the lessons of experience. There are, of course, plans and plans, and hasty generalizations in regard to cost are apt to be misleading, but it is not a hasty generalization which declares that more material and more labor enter into the construction of a hospital of a given capacity, in which separate rooms of suitable size with corridors between are assigned to all patients, than enter into the making of one in which a considerable proportion of the patients are lodged in open wards. But it is not my present purpose to analyze the economics of the question or to attempt to review all of the arguments that have been adduced either in favor of or against the single room plan. Many of the arguments on both sides of the question have become trite, and their restatement would probably prove somewhat tiresome.

It may be assumed that all experienced hospital men favor the use of single rooms, first, for all patients who desire and who can afford to pay for them, and for the additional service which is indispensable to their proper care, and second, for all patients who need single rooms and individual service, whether they can afford to pay for them or not.

The real point at issue is whether or not all patients do need single rooms. To put the matter differently, are the chances of care invariably improved, is the period of treatment unquestionably shortened, is the patient's comfort necessarily enhanced, is the safety of the patient always promoted, by placing him in a single room rather than in a larger ward? The question of cost, however interesting and practical, is, to my mind, a question of secondary importance. In the present editorial I propose to confine myself to the factor of safety alone; for in the numerous contributions that have recently been made to the discussion, this aspect of the matter has received little or no attention.

We are told that in the single room hospital, in which a utility room is directly connected with each patient's room (closet would perhaps be a more accurate term than room, for latterly, faced with the question of cost, advocates of the single room hospital have been paring down single rooms to the proportions of a linen closet), the added cost of construction is, to a considerable extent, offset by the economy of labor which results from having the utilities, supplies, and fixtures that are essential to bedside nursing close at hand. The quick resulting service is presented as labor-saving, time-saving and highly beneficial

to the patient. In the now familiar presentation of the subject the drama always begins with the nurse at the bedside, it being presupposed that the nurse will be summoned, and will promptly appear at the patient's summons, whenever needed. Well, indeed, for the patient, if this were true! Unfortunately, experience teaches the contrary.

Let me now present sample records obtained from a hospital of at least average efficiency—a hospital in which the number of nurses employed for ward duty is somewhat above the average (as shown by a recent investigation), a hospital in which only a small proportion of the so-called ward patients occupy single or "separation" rooms, and in which the practice prevails of employing special or individual nurses for some but not all of the ward patients who are thus accommodated. Let us turn for enlightenment to the illuminating experience of such a hospital.

Remember the conditions: an open ward; a limited number of patients in quiet rooms; push buttons handy; floor nurses on call; special nurses assigned to certain cases whose greater need is recognized and who are, therefore, singled out for special care; other patients left alone from time to time, but provided with the means of summoning a nurse at will. Among the patients who are left alone are some who are feverish and confused, some who are timid, others who are impatient and irritable, many who are ignorant—in a word, just the common ordinary run of human beings in ordinary circumstances, with the average capacity of the uneducated in strange surroundings, but with their normal intelligence often clouded and their slight capacity for adaptation lowered by sickness.

I shall now present actual case reports, prepared and submitted under a standing hospital rule that all "accidents" must be promptly reported in writing by the responsible house officers and nurses to the hospital administration:

Case I. At about 9:50 p.m., J. E., room —, first day post-operative for acute appendicitis, with peritonitis, got out of bed and walked into the hall, where he was discovered and put back to bed.

Case II. Last night I relieved a nurse in Ward — for supper; while I was sponging a patient on the ward, an orderly came and told me that S. H., a patient in a back room, had fallen out of bed, and that he had put him back in bed. I went in immediately, found the patient apparently uninjured by the fall. His pulse was 80, and a good quality. I immediately notified Dr. ——.

Case III. At 1:30 a.m., I. K., a patient in room —, got out of bed, and walked into the hall. On seeing the patient, I immediately put him back in bed, and notified the house physician.

Case IV. I was obliged to leave P. T., an operative of yesterday, bilateral hernioplasty, for a few minutes this morning in order to prepare breakfast. While I was thus engaged the boy got out of bed. The crib sides were up and a restraining sheet was on.

Case V. E. W., Ward —, diagnosis carcinoma of signoid, complication post-operative pneumonia. At noon yesterday the patient was given a bedpan, the orderly being at lunch. At this time Miss M. relief nurse, was pouring medication, and I was cleaning the medicine chest. A few minutes later ward patient called out. Responding immediately, I found E. W. out of bed, sitting on a chair. The patient was at once put back to bed. There was no apparent change in his condition, except a markedly increased pulse rate.

Case VI. At 11:30 p.m., patient on Ward — got out of bed and was found sitting on a chair by the bed. She was examined shortly after by Dr. ——, and her condition was found to be unchanged. She is a patient suffering from myocardial insufficiency, and there were sideboards on her bed. The accident occurred while the nurse was attending to a patient in one of the back rooms.

Case VII. At 3:30 a.m., D. W., a Ward — patient, fell out of bed. When examined by me, the patient was found to have an abrasion on the third finger of the right hand. This patient was suffering from diabetes and pneumonia. The accident occurred while the nurse was attending to a patient in one of the back rooms.

Case VIII. F. A., a patient of Dr. L., room —, at 7 p.m., yesterday, opened the window and threatened to jump out. She was put back in bed. The patient seemed perfectly rational otherwise.

Any hospital which studiously records its experience can present abundant material of a similar kind. The lesson, I think, is plain. As I read it, it is this: A hospital which places a sick person alone in a room, without immediate supervision, assumes a serious responsibility; the patient who is thus left alone runs a serious risk.

It is the duty of every hospital to provide single rooms for a certain proportion of its ward patients, whatever the cost may be; but let us remember that with every extension of this type of service, additions to the nursing force must be provided as a measure of safety.

I was about to conclude with the statement that in supervision lies safety, and in supervision only. But perhaps I am all wrong; perhaps the time has come (I believe that a recent writer seriously proposed something of the sort) for the hospitals of America to adopt the practice of Japan, where it is the custom to invite the relatives and friends of patients to come and stay at the hospital to take care of their sick, to cook for them and feed them, and to give them the prescribed medication (and any other medication of their own choosing). I must confess that I was

not much impressed with this kind of hospital care when I saw it in Japan recently; but it is quite possible that my judgment has been warped by long contact with American hospital conditions. If the Japanese system is good enough for America, the single-room radicals are right and I, a separation-room moderate, am wrong. It is for the sane and experienced hospital superintendents of America to decide.—S. S. GOLDWATER, M.D.

## DEMONSTRATIONS IN NEARBY CITIES AS SUPPLEMENT TO CONVENTION

THERE is a concomitant phase of the annual conference of the American Hospital Association that the Association has not thus far taken the initiative in developing to its fullest possibilities. We refer to the opportunity that exists for its delegates and members to attend well organized demonstrations of various timely or outstanding aspects of hospital development or procedure immediately before and after the convention. Often the convention offers the superintendent the only opportunity he has in the course of the year to see at first hand some of the significant things other institutions are doing. But the services of the American Hospital Association in helping him to make the most of his opportunity have hitherto been practically negligible.

Left to his own initiative, the individual superintendent who is seeking light on some special, and perhaps to him perplexing, problem, may, if he happens to know where to go, find the help he is seeking. Frequently, however, his search means the loss of valuable time and the expenditure of unnecessary effort. Now and again local groups, seeing the need and opportunity, have taken it upon themselves, quite apart from any action by the national association, to put the visiting superintendent in touch with some of the local institutions. Commendable as these efforts are, the superintendent all too often is escorted about by an ill-informed guide, blissfully ignorant of the visitor's immediate interest and of the institution's ability to satisfy it. At best, this is a tiresome and deadly procedure.

THE MODERN HOSPITAL has long held that there was a better way, the inauguration of which hospitals superintendents and trustees would welcome; and some time ago suggested that, in connection with the 1922 annual meeting at Atlantic City, local committees be appointed in several of the large cities nearby; let us say, Baltimore, New York and Philadelphia, whose duty it would be to plan definite demonstrations in certain of the hospitals and then see that they are run off on a very definite but not too crowded schedule.

Let us assume, for example, that such a committee is at work in New York. For the superintendent who is interested in group practice by the medical staff of a hospital, what could be more profitable than a morning at the Broad Street Hospital with the medical group in full swing? Perhaps Dr. J. Barker Savage, the wide-awake executive of this uniquely situated institution, the standing of which was greatly enhanced by the expeditious manner in which it handled the victims of the Wall Street bomb explosion, could be induced to talk briefly on the subject of group diagnosis and treatment as it has been evolved in his institution. Organizing medical skill, so that persons with moderate incomes can utilize it at a price within their means, is a pressing subject. The Cornell Pay Clinic is making a practical contribution to the solution of this problem, and some of the delegates would undoubtedly wish to visit it on their way to or from Atlantic City.

Delegates interested in the training of nurses would welcome an opportunity to inspect the building at Mount Sinai Hospital which has been remodeled and set aside exclusively for the use of its school of nursing.

Others will wish to study Mount Sinai's methods of conducting its dietetic department and to have a word from Miss Graves, who is now supervising dietitian of this institution.

The war stimulated an interest in the physical rehabilitation of the handicapped, and some of the delegates to the conference would undoubtedly wish to see the notable work now being done at The Reconstruction Hospital, where many of the methods and appliances evolved during the war are being used in the restoration of workmen handicapped in industry.

One of the subjects under active discussion just at present is the abolition of wards in hospitals and the substitution of individual rooms throughout. The new Fifth Avenue Hospital is one of the outstanding embodiments of the individual room idea and will warrant careful study. Perhaps no other institution in the country handles more emergency cases than does Bellevue and Allied Hospitals. Its emergency department is well organized, and well worth while visiting by any interested in this subject.

These are but a few of the possibilities New York offers. Others will readily suggest themselves to any committee that may be appointed. The immediate consideration, however, is to have a well organized program of visits and demonstrations and a carefully chosen group of local representatives to see that the program is carried out on scheduled time.

## AT THE SIDE OF THE ARCHITECT

TAKING the hospital buildings of this country and Canada by and large, we think it may be safely asserted that, with relatively few exceptions, they more nearly represent the ideas of the architect than those of the superintendent in such matters as the main units of the structure, their size, their relation to each other and their permanent equipment. This is in all probability due to the fact that it seldom occurs to the average superintendent to map out more or less in detail, for the use of the architect, the program of operation for the new hospital, or to visualize the plan he would like to have the architect execute in order to fulfill the purpose of the institution.

Under these circumstances one of two things eventuates. From the very outset a new hospital is planned by an architect inexperienced in hospital building, who either slavishly follows the plans of some similar institution—its mistakes as well as its triumphs—or incorporates in his plan a medley of ideas gleaned from a study of the plans of other hospitals; or it is planned by an architect who is as conversant with hospital planning as one who has not actually administered an institution can be. In neither case has it been possible to focus on the problem the knowledge and insight of the experienced hospital executive.

Two factors of late have in some instances served to mitigate this situation: on the one hand, hospital architects (and they are few in number) who have specialized to the point of actually entering the field of professional hospital management, and on the other hand thoroughly competent hospital consultants (and they, too, are few in number).

But who among the architects, even those who may rightfully lay claim to the title of hospital architect, will contend that this is a desirable situation and should continue to prevail? They are few indeed, if the statement of no less a person than Mr. Henry H. Kendall, the president of the American Institute of Architects, (see page 211 of this issue) may be regarded as a true reflection of the mature opinion of the architectural profession as a whole. "The superintendent," says Mr. Kendall, "is usually the authorized spokesman of the employing body, and rightly so. He alone has his hand and mind upon every detail of the organized work of the hospital. He knows the details of procedure as no member of the board or building committee can. He understands the daily routine of administration and what the duties of each group or individual are. He has had a part in the management of other institutions and knows, often from bitter experience, what errors in planning or arrangement can be made. If a man of force and ability, he will have definite ideas as to where and how he wishes his units arranged; all of this information he will bring to his architect. On the other hand, the architect, if he is the man of experience he should be, will be able to bring to such consideration other solutions of kindred, if not identical, problems."

In other words, the hospital of the future, instead of embodying as it has done all too often in the past the ideas of the architect solely, will be the joint product of the architect and the hospital executive.

That many superintendents in the past (and some at present) have not been competent to give authoritative instructions to the hospital architect as to the basic requirements of new hospital structure, the size of its integral parts, their interrelation and their permanent equipment, is freely conceded; but, with what promises to be a rapid growth of hospital management as a profession, we shall find the hospital superintendent assuming his rightful place in planning the hospital of the future. That place will be at the side of the hospital architect.

## CONVENTION ON "MILLION DOLLAR PIER"

NOW that the Middle West and Canada have had the annual conference of the American Hospital Association during the past three years, it has seemed desirable to the Association trustees that the 1922 meeting be held in the East. Atlantic City has been chosen, and the meeting will be held on the "Million Dollar Pier," September 25 to 29.

Before reaching this decision the trustees entertained invitations from a number of cities in the East, but none of these cities possessed hotels combining all the facilities needed for the convention—a sufficient number of rooms, meeting halls adequate in number and capacity, and the requisite amount of space for the exposition.

Conventions of the Association held wholly within hotels are evidently a thing of the past. The "Million Dollar Pier" affords adequate accommodations for the general sessions of the convention, for concurrent sectional meetings and abundant space for the exposition as well. Within convenient walking distance are hotel rooms in abundance, with a wide range of rates guaranteed by Atlantic City's convention bureau.

In this connection the attention of Association officials in charge of the program is called to the suggestion we made after last year's meeting in

regard to reducing the number and the length of papers on the formal program. This suggestion was based on rather widespread criticism of the unreasonably crowded program of papers and addresses, one of them in particular taking fully two hours to read. We believe that the real purpose of the convention is in some measure defeated by too many papers. Despite every good intention, interest flags during the latter half of the conference. What difference does it make in the long run of year if on this particular occasion four or five fewer papers are read? Let there be but two sessions each day, and thereby give delegates great opportunity for informal conference, for the inspection of exhibits and for the recreational opportunities Atlantic City offers. Their interest in such papers as are read will be all the greater.

## HOSPITAL PUBLICITY

MANY hospitals wait until they need public support before they tell about themselves. This is true almost without exception of all hospitals. There is a good reason for it. Physicians have been trained to avoid publicity in their private practice, because it is contrary to the ethics of the profession to indulge in advertising, which is publicity. Many hospitals are managed by physicians or boards of physicians, and while their code of ethics does not prohibit publicity for the hospital they are not prepared to be whole-heartedly in favor of it. And even if they desire to keep the institution before the public they do not know how to accomplish this aim.

The hospital that derives its funds from the public and that appeals to the public for its patients owes it to that public to let it know in detail how every penny is expended. The public is interested in knowing that its contributions bring good results. In other words, the hospital is the public's institution. Publicity is no more or less than a medium through which the institution from day to day advises its public of its work. It is not fair for the hospital to allow ten months of the year to pass in silence and then, preliminary to a money solicitation, begin to bombard the giving public with facts concerning itself. Such a course is almost insulting. The public's reaction is natural when it replies, "You pay no attention to me until you want something. After I have given, you close up and let me know nothing more for a year."

The local hospital should keep in contact with its community twelve months in the year, year in and year out. Let the hospital make it known that it considers itself a part of the community and asks support solely on that ground.

## A POWER IN BRITISH HOSPITALS

SIR ARTHUR STANLEY

SIR ARTHUR STANLEY, president of the British Hospital Association, is closely identified with hospital and health work and through his many connections with health organizations has contributed much to human welfare in Great Britain. He is treasurer of St. Thomas' Hospital, chairman of a Joint Council of the British Red Cross Society and the Order of St. John, a member of the board of governors of the League of Red Cross Societies formed under the covenant of the League of Nations, chairman of the National Association for the Prevention of Tuberculosis and holds office and membership in several other organizations of that character.

At the beginning of the war Sir Arthur accepted the chairmanship of the British Red Cross Society and when later in 1914 a joint committee of the British Red Cross Society and the Order of St. John was formed he was made chairman and served during the entire war period. In this capacity he had an opportunity to study the status of the nursing profession and from his findings arose the College of Nursing, an institution solely for nurses and governed by them.

Sir Arthur is the son of the late Earl of Derby and from 1898 to 1918 was a Member of Parliament for the Ormskirk Division of Lancs. His increasing philanthropic duties made it necessary for him to relinquish his seat. In 1918 the French government conferred on him the Commandership of the Legion of Honor.

# THE REAL MEANING OF A HOSPITAL STAFF*

By REV. M. P. BOURKE, A.M., LL.B., Chaplain, St. Joseph's Sanitarium, Ann Arbor, Mich., and Director of Catholic Hospitals, Diocese of Detroit

ON MARCH 1, 1918, the American College of Surgeons forwarded to the hospitals of the United States and to the Fellows of the College its now famous plan for a minimum standard. Part of this plan had of necessity special reference to hospital staffs. It was in my judgment the most comprehensive and at the same time the most practical and reasonable plan ever suggested for hospital betterment. Many of us disagreed, and I think rightly so too, with some of its provisions. I for one thought that in some of its features it stressed the material to the detriment and, in some measure, the complete obliteration of the spiritual. But I know that in giving it out the committee was obliged to have in mind conditions I could not foresee, and I think I had the good sense to know that nothing human can ever be either ideal or complete. I have often wondered if full credit will ever be given to the man who above all others was responsible for the almost universal adoption of this standard, John G. Bowman, the present scholarly and capable chancellor of the University of Pittsburgh.

Let me quote from the bulletin of the College (Vol. IV, No. 4) a few of the provisions of this standard, before, with this for a basis, I address myself to the specific theme of this morning. The minimum standard is thus summarized in this publication.

## Minimum Standards of Hospital Staff

"1. That physicians and surgeons privileged to practice in the hospital be organized as a definite group or staff. Such organization has nothing to do with the question as to whether the hospital is 'open' or 'closed'; nor need it affect the various existing types of staff organization. The word staff is here defined as the group of doctors who practice in the hospital inclusive of all groups such as the 'regular staff,' the 'visiting staff,' and the 'associate staff.'

"2. That membership upon the staff be restricted to physicians and surgeons who are (a) competent in their respective fields, and (b) worthy in character and in matters of professional ethics; that in this latter connection the practice of the division of fees, under any guise whatever, be prohibited.

"3. That the staff initiate and, with the approval of the governing board of the hospital, adopt rules, regulations, and policies governing the professional work of the hospital; that these rules, regulations and policies specifically provide: (a) That staff meetings be held at least once each month. (In large hospitals the departments may choose to meet separately.) (b) That the staff review and analyze at regular intervals the clinical experience of the staff in the various departments of the hospital, such as medicine, surgery and obstetrics; the clinical records of patients, free and pay, to be the basis for such reviews and analyses.

"4. That accurate and complete case records be written for all patients and filed in an accessible manner in the hospital, a complete case record being one, except in an emergency, which includes the personal history; the physical examination with clinical, pathological, and x-ray findings when indicated; the working diagnosis, the treatment, medical and surgical; the medical progress; the condition on discharge, with final diagnosis; and, in case of death, the autopsy findings when available.

"5. That clinical laboratory facilities be available for the study, diagnoses, and treatment of patients, these facilities to include at least chemical, bacteriological, serological, histological, radiographic, and fluoroscopic service in charge of trained technicians."

## Hospitals Far Below Standard

Now let me ask, with this for a reasonable standard, how many real hospital staffs are there in existence in the United States today? I think I can say without fear of contradiction that there are not half a dozen hospital staffs in America, in the real meaning of this term. The unfortunate mental attitude of the average doctor leads him to the conclusion that a hospital owes him everything, and that he has very few corresponding obligations to the hospital. That is a broad statement. Upon what do I predicate it? Starting with the undisputed acknowledgment that the first and the real objective of a hospital is the good of the individual patient, to what conclusions are we led?

*First*: A patient coming to a hospital is the exclusive charge of no one man. If he is, then the term "staff" is a ridiculous misnomer. Now by that I mean that every patient has a right in justice to the best that the hospital can give. If his attending physician feels that he can be more competently attended by some other member of the hospital group, then why should he be denied this advantage? If the attending physician feels that there are features of a patient's case that call for other expert advice and attention, why should the patient be denied this advantage?

## Individual Efforts Instead of Cooperation

You may tell me that this practice of referring cases is impractical. I tell you that it has proved eminently practical in the few places where it has been fairly tried. And the doctors are none the worse for their fairness, because reciprocal exchange about equalizes matters between them. What is a staff after all if you do develop group service? It is just a list of doctors accorded the courtesy of practicing in the same house. There is no coordination; no mutual cooperation for the benefit of all the patients; nothing but individual effort with merely nominal centralization. Outside of the facilities offered by a well conducted hospital, the patient is no better served in a medical way than if he had been attended in his own home. And this is not my idea of efficient staff organization.

Now mark you, I do not maintain that a doctor must relinquish all claim to his patients when they enter the portals of an institution of whose staff he is a member, but I do maintain that he must have always in mind the greatest good of the sufferer; and that he should be prepared in justice to see to it that this right of the patient is respected even though at times it may result in some financial loss to himself. He is not going to lose his practice in that way. He is going rather to obtain increased respect for himself, and no one will take advantage of his fairness to deprive him of his practice but an unpro-

*Read at the fifth meeting of the Michigan Hospital Association, Flint, Mich., January 19, 1922.

fessional ingrate,—and there is no room on any decent staff for practitioners of that type.

### Staff Meeting Apt to Be Burlesque

*Second*: One of the requirements of the minimum standard as outlincd is a monthly staff meeting to be attended by every man practicing in the hospital. This can mean everything, or it can, and usually does, mean *nothing*. A review and analysis of the clinical experience of a staff is invaluable if rightly conducted. Deaths and unimproved cases can be discussed; laboratory findings presented; the result of autopsies shown; symptoms reviewed. If however this discussion is to take the form of a mere routine recital of procedure and findings without honest criticism; or if the staff members are so delicately considerate of the feelings of each other that they are afraid to air their views of methods, diagnoses, and treatments honestly, then the whole affair is a monumental burlesque. A modern day staff meeting is a consultation on a larger scale. And it loses the benefit of this feature if its members are too thin-skinned to speak their honest convictions. Why should I, as a member of a staff, sit silently by listening to a fellow practitioner's narrative, when I am positive he is omitting symptoms (honestly of course) that change the entire nature of the case under discussion? Why should I not inquire as to manifest departures in treatment from the conventional and the well approved? Why should I not make inquiries as to a failure to adopt new methods, late scientific findings, up-to-date appliances? And yet I am talking to a group of hospital executives, and it would be interesting to know how many of your staffs actually do put these expedients into practice. No one's feelings should be hurt by honest criticism; the young especially will be benefitted; and the clash of exchanging thought will give birth to new ideas that will put your institution on the map.

### Chief of Staff Must Be Fearless

*Third:* I often ask myself if the ordinary staff really exercises fair judgment in the selection of a chief. Years alone are not test. Experience is an aid, but it is the combination of both, in conjunction with real ability, that points the ideal. At times I wonder if my notion of a chief-of-staff is fully orthodox. I do not believe this office is an ornament, a reward for years of service, or a sinecure. A man need not be picturesque to fulfill its duties well, but he *must* be competent and honest and respected by his colleagues. He should be a chief in truth. He should be capable of supervising the work of the medical and surgical departments of his trust. He should be big enough to command respect, and fearless in his demands for the right. My own impression is that he should be a general surgeon, with sufficient experience and ability to supervise the work of his fellow staff members. He ought to be considerate but he must be firm in upholding the standards of his profession. It does not require much perception to note that there are many men practicing medicine today,—surgery in particular—who are utterly lacking in the essentials for success. The chief-of-staff has the bounden duty to see to it that such men have competent help, make improvement, or be denied the privilege of the house. Faulty technique, carelessness in asepsis, slovenly aftercare of patients, negligence in diagnosis,—these, every one of them, are his to correct in person or as head of a properly selected committee. Am I putting too much on the shoulders of the chief? John B. Murphy did this in Chicago for many years, and I can name a few who are doing it exceptionally well today. What I have to say in this connection does not, of course, apply in all respects to those institutions that are directed by competent medical supervisors.

*Fourth:* One adjunct of the staff should never be lacking,—and that is a well chosen independent record committee. A part of each month's order of business should be a report on the records of the staff. Mistakes must be honestly pointed out; omissions must be noted; improper notations corrected. When records call for signature the signature must not be lacking. This work cannot be delegated. A fair proportion of it belongs not to the intern or nurse, but to the doctor in attendance. And the staff should insist upon its proper and timely performance. One of the burdens of the record-keeper's existence is found in a refusal of members of the staff to work up and sign the records of their case. Strangely enough it is frequently the men least heavily burdened professionally who have the least time for this all important duty. No staff can afford to overlook such a lamentable shortcoming. If a doctor is too busy to keep his records in order, he is really too busy to be connected with the hospital. And where the report of the record-keeper and the record committee disclose chronic laxity in this important duty, provision for automatic expulsion should be provided by the hospital regulations.

### Record Committee Makes for Accuracy

Not many hospitals have a record committee of the staff. In this they are unquestionably the losers. The psychological effect of realizing that once every month, on a fixed and certain day, your records will be scrutinized by a group of your fellow doctors makes for accuracy, regularity and completeness.

What right have you moreover to tolerate on your staff a man whose slovenly habits, or careless conduct, endanger your hospital rating? The hospital visitor may found his report of an inferior rating upon the negligence of this very man. And it is the duty of the staff to protect the hospital by reasonably warning this delinquent, and then summarily dismissing him if the warning goes unheeded.

The surest guaranty of good records is a competent record committee of the staff, and its appointment I heartily commend to every hospital in the land.

*Fifth:* The last requirement of the minimum standard relates to the clinical laboratory. The work of the laboratory, pathological and x-ray, is one of the prominent wonders of the day. It affords facilities for diagnosis and treatment that are nothing short of marvelous. And the well managed staff should see that these institutions are properly maintained. Fixed routine for certain examinations should be rigidly insisted upon. The golden rule has broadest scope in this division of the hospital. We have no right to overlook in the case of others what we should unfailingly insist upon in the care of ourselves or our families.

### Too Great Dependence on Laboratory

The staff should take summary action against the man who will dare to perform a nephrectomy without previous cystoscopic exploration. The staff should visit with extreme penalty the surgeon who will dare to make an incision without proper urinalysis and serological findings. The staff is in duty bound to remonstrate in no uncertain terms with the otolaryngologist who will undertake to perform a tonsillectomy without proper tests for blood coagulation. All of these things I base of course upon the assumption that the cases in question are regular, and not extraordinary instances of emergency.

By a paradox, if you will, I think the pathological,

bacteriological, serological and x-ray laboratories, wonderful as I acknowledge them to be, have done no little harm to the profession. The young man of today is forgetting how to use his eyes and his ears and his fingers. He is depending for his diagnosis on the laboratory man. And the years to come will show how truly unfortunate this is. The laboratory is a check; it should not be used except for the confirmation of a diagnosis. Exceptions to this will be found to be sure, but that is the rule, none the less.

Valuable time is lost nowadays by too servile dependence on the laboratory. And its most glaring instance is met with in the case of contagious and infectious diseases.

But the good laboratory must be encouraged by the medical staff of the hospital. And the good laboratory man is a real treasure.

So much for my opinion of the duties of the staff in specie. Let me add one word of general exhortation. Please try to eliminate discord from your hospital staff. Select representatives for your various departments that are not alone capable but companionable if possible. And keep off your regular associate and visiting staffs the incompetent and the quarrelsome. They are expensive at any price.

Do not forget that you owe your hospital a duty, larger in a certain measure than it owes you. Labor for harmony, but never at the expense of honesty. Give of your best to the hospital that honors you with a place of trust in its affairs, and the return will always be proportioned to your bounty. The dividends in the medical investment always bear some relation to the capital placed in the venture.

# A LABORATORY IN THE SMALL HOSPITAL*

By S. G. DAVIDSON, Superintendent, Rockford Hospital, Rockford, Ill.

*Two essentials in establishing and maintaining a laboratory in connection with a hospital, be it large or small, are, according to Mr. Davidson, a well-paid pathologist and excellent equipment. Neither of these requirements makes the laboratory prohibitive to the small hospital, for a minimum list of high grade equipment can be purchased for between $600 and $900 and a good pathologist can prove himself so indispensable and make the laboratory so profitable that he will earn a neat salary. Conversely no hospital even in the smallest community can afford to struggle with cheap equipment or to employ a poorly trained laboratory worker at any salary. The experiences of three Rockford, Ill., hospitals in starting a laboratory should prove inspiring to superintendents, trustees and physicians in small cities who have long recognized the value and felt the loss of laboratory facilities.*

CAN we afford a laboratory? How can we finance it? What is the cost of operation? What equipment do we actually need? The problem of the laboratory is one of the colossal ones which face the management of many of our smaller hospitals; too often the answer is, "We will have to get along without it for a time." Such an answer grows out of the fact that boards of trustees and many superintendents do not recognize its value.

No hospital can afford to operate without its laboratory; and a corollary to this is that no hospital can afford to operate a laboratory unless the work is being performed by a competent man or woman. We all know that good medical practice must be based on correct diagnosis. It is perhaps the most important function of a hospital to provide every possible facility for correct diagnosis and treatment. Although the laboratory is a prime necessity in rendering this service, there are many institutions proceeding year after year without a well equipped diagnostic department. This little paper is written with the hope that it may assist boards of trustees and superintendents who are considering the installation of such a department.

Recently we have installed a laboratory in a hospital of 110 beds in our city of 70,000, situated 100 miles from Chicago and 75 miles from Madison, Wis. There are two other hospitals in this city, one of 75 and the other of 125 beds. None of these institutions had any laboratory facilities, excepting our own which had some small equipment for making urine analysis, a sink, a microscope, and a small centrifuge which we later had to scrap. In the city are ninety practicing physicians and, of course, the usual number of men in the smaller surrounding towns. The only laboratory service in the city was that maintained by a physician, operating a private laboratory. These facts are being presented because they all have a bearing upon the establishment of laboratories. The proximity of such cities as Chicago and Madison (with its university) made it possible for physicians to send specimens to those places for examination.

That there was no laboratory service in the local hospital demonstrated its need; it was appalling that graduates of high class schools of medicine were compelled to practice their professions under such antiquated conditions. To find space for the laboratory, once we decided upon it, was easy. There is always some odd room in any hospital that can be utilized. We were particularly fortunate in being able to use a room with light on three sides, north, south and west. We had an old stone sink and a Baush and Lomb microscope. We obtained price lists from laboratory supply companies in Chicago, New York, and Philadelphia. The names of these firms were obtained from The Modern Hospital Year Book. We studied the prices on the equipment very carefully. From our analysis we found we could equip the laboratory for approximately $1,500.

By talking among friends of the institution the need of this service and its benefits to the community, we persuaded a well-to-do woman to give us the laboratory equipment as a memorial to her father. Our next thought was to get a competent pathologist. We wrote to all of the Class A medical schools in the country, setting forth the conditions and prospects in Rockford with the written assurance that the right type of man could quickly build up a compensation of, at least, $6,000 a year. Also we advertised in the A. M. A. Journal and were fortunate in obtaining the service of a man who had been associate professor of pathology at one of the large medical schools of Chicago and in charge of the laboratory in the hospital connected with that school. In this connection I wish to emphasize the fact that no matter

*Read at the annual conference of the American Hospital Association at West Baden, Sept. 12-16, 1921.

how small the hospital or the community, it can afford to pay a good salary to a good pathologist and conversely it can not afford to employ any poorly equipped laboratory worker. Even our larger hospitals have made the serious mistake of paying day-laborer's wage to their pathologist until conditions have become such that few medical men specialize in this branch of the profession. None of our equipment was purchased until we had hired our pathologist; with his advice we purchased it in Chicago for the sum of $1,588. Included in our purchases were all the equipment, glass ware, and reagents necessary for a laboratory capable of doing the work for the three hospitals. It is all of the best material.

### Financing the Laboratory

How best to finance the laboratory was another one of our problems, and after a thorough discussion with the staff we decided to increase the rates fifty cents per day on all beds in the hospital, then on every bill paid to deduct that amount and credit it to the laboratory account. This additional charge was based on the number of patient days in 1920, which amounted to a little over 32,000, or a probable income of $16,000, provided everyone paid his bill; in any event it must give us an income of at least $10,000, and after deducting $3,500 for the minimum salary of our pathologist and estimating our laboratory expenses at $1,500, we would still have $5,000 to be divided equally between the hospital and the pathologist, thereby making his compensation $6,000 for the first year. In addition we felt we would have considerable income from outside work. This is proving to be the case. Last summer our hospital ran very light, and in the face of this we showed a net profit each month. Our doctors are delighted with the laboratory and are using it as a strong talking point, not only because of the service it renders but also because this service is practically free.

There are, of course, many other methods of making laboratory charges. There is a flat rate for each patient who comes into the hospital which very often forms the basis of financing the work. And there is the method of charging on a fee basis, although I believe that this is by far less successful because charges may seem excessive to the patient and as a consequence less laboratory work will be done. Of course, the ideal condition is to have the laboratory endowed.

### Equipment Not Expensive

As I stated before, our laboratory is equipped to take care of all the work in the city of Rockford, so you will realize it must be complete. But in smaller communities or smaller hospitals there is not the need for such elaborate, expensive or complete equipment. We have studied the needs and problems of small laboratories carefully and in a hospital of forty or forty-five beds, serving a community of from 10,000 to 20,000 people, the laboratory can be provided at a cost of between $600 and $900. The equipment listed at the end of this paper costs approximately $800, although there is no microscope or colorimeter listed. Microscopes can be purchased for $110, and no matter how small the hospital there is usually a microscope in the institution which the doctors have used for their smaller routine work. This list also includes equipment which can be dispensed with, as, for instance, the autoclave listed at $200. For a small hospital, one costing from $75 to $100 will do as well, or why use an autoclave at all? All sterilizing can be performed in the autoclave of the operating room and this would mean a considerable saving. There is no need of a Wassermann bath if the expense is too great, because a laboratory man can use the incubator for blood cultures and Wassermanns. A good combination microtone should be purchased, and if the hospital then desires to cut expenses there will be no need of having a paraffine oven for, unless there is a great deal of section work, all examinations can be made frozen sections. The best microtone can cut as thin as five micromes, which is about the same as a paraffine section cuts. The incubator listed is large enough for a 300 bed hospital and one could be purchased half this size which would do all the work. I do believe, however, a colorimeter should be purchased so that the laboratory may do all kinds of work, including blood chemistry. Such a colorimeter can be purchased for $125.

The two points I wish most to emphasize in this paper are that a good pathologist be employed and a good salary paid or guaranteed him and that good equipment be purchased even though, in so doing, it compels the laboratory worker to use such combinations as have been noted. With a high type of laboratory work turned out, business will so increase as to permit the institution very quickly to add to its equipment.

### Equipment for Small Laboratory

| | | | |
|---|---|---|---|
| Incubator for all bacteriological cultures and Wassermanns | $90-$137.50 | Test tubes | 10.00 |
| Autoclave | 75- 200.00 | 2 Bunsen burners | 3.00 |
| Test tube baskets, 60c each | 1.80 | Filter paper, 3", 5" and 13" | 3.00 |
| Plantmour hot water funnel, copper | 7.25 | 1 Levy counting chamber. | 7.00 |
| Centrifuge | 54.50 | Red and white blood pipettes | 1.50 |
| 2 chemical thermometers, 110 c. | 1.25 | Tallquist hemoglobin scale | 1.75 |
| 2 chemical thermometers, 250 c. | 2.00 | 1 trip scale | 10.00 |
| Balance | 60.00 | 1 set weights | 3.60 |
| B. & L. combination microtome, complete | 108.50 | Platinum needles, each | 1.20 |
| Paraffine oven | 50.00 | Corks and rubber stoppers | 3.00 |
| 4 section lifters | 3.00 | Cork borer | 1.75 |
| 1 doz. camels hair brushes | .35 | Glass pencils | .25 |
| 1 doz. teasing needles | .60 | Nichrome wire | .75 |
| 2 test tube racks | 2.00 | 1 doz. pinchcocks | 1.80 |
| 2 iron retort stands | 3.00 | 1 doz. Coplin jars | 4.40 |
| 1 iron purette stand | 1.50 | 1 Esbach albuminometer | 1.20 |
| 1 Chapman filter pump | 2.00 | Urinometer | 1.00 |
| 1 water bath | 2.25 | Urinometer jars, each | .12 |
| 2 tripods | 1.20 | Evaporating dishes | 2.00 |
| Wire gauge, 6x6 | 1.08 | Mortar and pestle | .75 |
| Graduated cylinders | 5.00 | Pipettes | 5.00 |
| | | Flasks | 15.00 |
| | | Beakers | 15.00 |
| | | Stains and chemicals | 50.00 |
| | | Rubber and glass tubing | 5.00 |

## ANNUAL REPORT COMMITTEE NAMED

Announcement has been made by trustees of the American Hospital Association of the appointment of a committee to develop a standard form of the essentials of the annual report, as was authorized by the last annual conference. The personnel of the committee is the same as that of the hospital forms committee, which includes: Dr. A. C. Bachmeyer, superintendent of the Cincinnati General Hospital, as chairman; F. E. Chapman, superintendent of Mount Sinai Hospital at Cleveland; and Dr. John F. Bresnahan, superintendent of Bridgeport Hospital at Bridgeport, Conn.

## INSTALLS POWERFUL X-RAY MACHINES

Apparatus for the x-ray department of the Grace Hospital of Detroit for use in treatment of deep-seated cancer is being installed as a result of a recent $10,000 appropriation for that purpose by the board of trustees. Building alterations necessary for the installment of the large machines, which have proved highly successful for the treatment of deep-seated cancer in Germany, have been made. This apparatus is the first of the kind to be installed in Detroit.

**It is not life to live, but to be well.—Martial.**

# NURSING AND THE HOSPITAL

*Conducted by* CAROLYN E. GRAY, R.N.,
Department of Nursing Education, College for Women,
Western Reserve University, Cleveland, Ohio

## THE SUPERINTENDENT OF NURSES: HER SALARY

BY JOSEPH J. WEBER, MANAGING EDITOR, THE MODERN HOSPITAL, CHICAGO

WOULD $1,868 per annum, plus quarters, subsistence and starched laundry, be remuneration ample for the sundry duties, executive, professional and scholastic, incumbent upon a superintendent of nurses?

Whether it be sufficient or insufficient—surely none is so bold as to argue its oversufficiency—that is the precise yearly wage of superintendents of nurses and heads of training schools in the United States, according to statistics compiled by THE MODERN HOSPITAL based on data gathered from hospitals in various states in proportion to population. The monthly check, then, would pay to the order of Average Superintendent of Nurses $155.67. Out of this need come no room rent, no board bill, and funds for only such laundry as dare not be intrusted to ruthless modern machinery.

To make this brief survey of any statistical value, questionnaires were dispatched to 500 hospitals in the United States of less than 100 beds, distributed among the various states in the ratio which the population of each state bore to that of the nation according to the 1910 census. Out of this number, 112 hospitals, or 22 per cent, responded.

Questionnaires were also sent to 285 non-Catholic hospitals of 100 beds or more selected from the 1920 approved list of the American College of Surgeons. These hospitals were of wide distribution not only in the United States but in Canada. Of these institutions, 116, or 40 per cent, sent data.

With no appreciable variation these figures show that hospitals furnish board, room and laundry, or some part thereof, to all superintendents of nurses or of nurses' training schools. Each superintendent of nurses was asked in the questionnaire to estimate the monetary value of these items. Rather greater differences were discovered in these estimates than can be traced to varying living costs in urban and in small community centers. Some superintendents of nurses may have based their estimates on the actual cost of such service to the institution; others, more correctly for the purposes of this survey, may have calculated living costs as they would have to be met outside the hospital walls.

The average yearly living expenses provided by hospitals of less than 100 beds to superintendents of nurses is estimated at slightly over $500. Some estimates for board, room and laundry are as low as $300. In metropolitan hospitals falling in the group of 500 beds and over, yearly living costs provided by hospitals, as estimated, average $950. Some estimates run as high as $1,800; others touched the low level of costs in the smaller cities.

To place the hospitals on an equitable basis for comparison, those of the first group were separated into three classes: 1 to 49 beds; 50 to 74 beds; and 75 to 99 beds.

Similarly the 116 hospitals in the second group were classified as follows: 100 to 199 beds; 200 to 299 beds; 300 to 399 beds; 400 to 499 beds; and 500 and more beds.

In point of actual cash, high money in the superintendent of nursing field goes to the head of a western university hospital training school who gets $4,000. She, however, is furnished her meals only. The superintendent of nurses in a 2,700 bed institution receives $3,600; she estimates the value of living costs furnished her by the hospital as $600. As to what that $600 includes, the facts are incomplete.

Although financial reward certainly is not the primary motive with many superintendents of nurses—else another profession might have been chosen—love of the work must be practically the sole influence of one superintendent in a hospital of 120 beds. She is paid in cold, hard cash the munificent yearly stipend of $300. This superintendent estimates that $480 in food, quarters and laundry work is furnished her by the institution. Although her name may be emblazoned in giant characters on the Book of Good Deeds, she is not among those noted in the income tax lists, that highly desirable, if inconvenient, status.

Many of the smaller institutions, notably those of 50 beds or less, combine the positions of hospital superintendent and superintendent of nurses. There is a liberal range in salaries paid for such services; $1,730 is the average annual wage.

The high salary mark among the small hospitals (less than 100 beds) is $2,400. Two superintendents in Group I have attained this maximum.

In the large institutions 32 superintendents, or 27 per cent only, receive more than $2,000.

With advancing living costs, nursing superintendents' salaries have increased. Late 1919 and the year 1920 brought increases to the greater proportion of them. A few were granted further increases in 1921. Like other professions where salaries have never been proportionate to training and experience, there is little danger of reduction with lower living costs. The average rise in salary at the last increase noted by the superintendents of nurses was between $300 and $400. Some had to satisfy themselves with an extra $5 a month; more fortunate ones secured for themselves an advance of $50 or $60 a month.

City, county and state hospitals seem to pay lesser

amounts to their superintendents of nurses than hospitals supported by private funds. Such a conclusion is indicated from the data on the comparatively small number of hospitals supported by public funds represented in this survey. Further investigation would be necessary to make such a statement conclusive, however. State hospitals connected with universities are apt to pay more than the usual teaching hospitals, figures show.

In comparison with the salaries of superintendents in the same hospitals, data on which were compiled and published by THE MODERN HOSPITAL in the October, 1921, issue, the salaries of superintendents of nurses do not advance proportionately with the size of the institutions. For example, in hospitals of less than 50 beds, the superintendent of nurses receives an average compensation of $737 less than the hospital superintendent. When, however, the 500 bed group is considered there is a difference of almost $5,000 in the yearly remuneration. Does it not seem that the responsibilities of the superintendent of nurses would advance in the same ratio as those of the hospital's chief executive?

## Teachers' vs. Nurses' Salaries

The position of superintendent of nurses is not exactly analogous to that of any other woman executive. Perhaps the woman principal of a high school is the nearest to her for purposes of comparison. To become a high school principal requires long training, longer experience, and executive ability. Probably about the same number of women high school teachers become principals as graduate nurses become superintendents of nurses. Teachers, too, must meet the added and very real factor of competition for executive positions with the other sex. With only a limited number of annual reports of boards of education in cities and towns of varying size and geographical location on which to base an estimate, these figures may be subject to challenge, but salaries of women principals in public high schools seem to vary from $1,800 to $4,000. The middle western or southern town which pays the superintendent of nurses in its 40 bed hospital a salary of $1,483 for twelve months, with living quarters, food and laundry furnished, would probably pay its woman principal $1,950 for nine months' work. The eastern city which would pay $2,500 and living expenses to its superintendent of nurses would give its woman principal—when in rare instances her sex would be no stumbling block for the position—the sum of $4,000.

All things considered, there is slight difference in the salaries paid women executives in the professions of nursing and of teaching. The real obstacle to the nurse in putting executive positions in her field on a financial level commensurate with the requirements for their efficient conduct is more likely the general opinion of boards of trustees that the services of women are either worth less or may be obtained for less than those of men. The superintendent of nurses' salary problem, if she has a problem, is rather one in common with women in all professions.

### DETAILED INFORMATION REGARDING SALARIES PAID SUPERINTENDENTS OF NURSING IN HOSPITALS HAVING LESS THAN 100 BEDS

Range of Bed Capacity of 112 Hospitals—20 to 97 Beds.

*1 to 49 Beds*

Seven hospitals, or 6¼ per cent, of 112 hospitals under consideration.

Average salary of superintendent of nurses.....$1,483
Minimum salary..... 1,200
Maximum salary..... 1,800
Salaries above the average..... 5
Salaries below the average..... 2

*50 to 74 Beds*

Forty-nine hospitals, or 43¾ per cent, of 112 hospitals under consideration.

Average salary of superintendent of nurses.....$1,434
Minimum salary..... 960
Maximum salary..... 2,400
Salaries above average.....24
Salaries below average.....25

*75 to 99 Beds*

Twenty-nine hospitals, or approximately 26 per cent, of 112 hospitals under consideration.

Average salary of superintendent of nurses.....$1,691
Minimum salary..... 900
Maximum salary..... 2,400
Salaries above average.....13
Salaries below average.....16

### DETAILED INFORMATION REGARDING SALARIES PAID SUPERINTENDENTS OF NURSING IN HOSPITALS HAVING 100 BEDS OR MORE

Range of Bed Capacity of 116 Hospitals—100 to 2,700 Beds.

*100 to 199 Beds*

Forty-six hospitals, or approximately 40 per cent, of the 116 hospitals under consideration.

Average salary of superintendent of nurses.....$1,581
Minimum salary..... 300
Maximum salary..... 2,244
Salaries above average.....17
Salaries below average.....29

*200 to 299 Beds*

Thirty-three hospitals, or 28½ per cent, of the 116 hospitals under consideration.

Average salary of superintendent of nurses.....$2,020
Minimum salary..... 1,465
Maximum salary..... 2,500
Salaries above average.....16
Salaries below average.....17

*300 to 399 Beds*

Six hospitals, or slightly above 5 per cent, of 116 hospitals under consideration.

Average salary of superintendent of nurses.....$2,115
Minimum salary..... 1,440
Maximum salary..... 4,000
Salaries above average..... 1
Salaries below average..... 5

*400 to 499 Beds*

Eleven hospitals, or 9½ per cent, of 116 hospitals under consideration.

Average salary of superintendent of nurses.....$2,381
Minimum salary..... 1,500
Maximum salary..... 3,000
Salaries above average..... 6
Salaries below average..... 5

*500 and Over Beds*

Sixteen hospitals, or approximately 14 per cent, of 116 hospitals under consideration.

Average salary of superintendent of nurses.....$2,239
Minimum salary..... 1,768
Maximum salary..... 3,600
Salaries above average..... 9
Salaries below average..... 7

### SALARIES OF SUPERINTENDENTS OF NURSES AND HEADS OF NURSES' TRAINING SCHOOLS OF HOSPITALS HAVING LESS THAN 100 BEDS

| No. of Beds | Monetary Salary | Monetary Equivalent | No. of Beds | Monetary Salary | Monetary Equivalent |
|---|---|---|---|---|---|
| | | *1 to 49 Bed Group* | | | |
| 30 | $1,500 | $600 | 40 | $1,320 | $480 |
| 30 | 1,560 | 480 | 40 | 1,500 | 480 |
| 36 | 1,500 | 720 | 45 | 1,800 | 924 |
| 36 | 1,200 | Not estimated | | | |
| | | *50 to 74 Bed Group* | | | |
| 50 | $2,400 | $ 600 | 60 | $1,080 | $ 500 |
| 50 | 1,500 | 540 | 60 | 1,320 | ... |
| 50 | 1,200 | 780 | 60 | 1,020 | ... |
| 50 | 1,200 | 360 | 60 | 1,680 | 480 |
| 50 | 1,020 | 480 | 60 | 1,800 | 480 |
| 50 | 1,320 | 600 | 62 | 1,200 | 260 |
| 50 | 1,560 | 1,200 | 65 | 1,200 | Not estimated |
| 50 | 1,620 | 900 | 65 | 1,320 | 480 |
| 50 | 1,200 | 540 | 65 | 1,200 | 365 |
| 50 | 1,200 | 600 | 68 | 1,500 | 480 |
| 50 | 1,200 | 780 | 70 | 960 | 250 |
| 52 | 1,080 | ... | 70 | 1,800 | Not estimated |
| 53 | 2,000 | 780 | 70 | 1,500 | 600 |
| 54 | 1,800 | 400 | 70 | 1,200 | 360 |
| 56 | 1,200 | 400 | 70 | 1,200 | 540 |
| 57 | 1,800 | 600 | 70 | 1,200 | 600 |
| 60 | 1,800 | 720 | 72 | 1,080 | 400 |
| 60 | 1,200 | 600 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | *75 to 99 Bed Group* | | | |
| 75 | $1,500 | $ 420 | 80 | $1,800 | $ 900 |
| 75 | 1,620 | 780 | 85 | 1,800 | 650 |
| 75 | 1,800 | 600 | 86 | 1,920 | 720 |
| 75 | 900 | .... | 86 | 1,400 | 840 |
| 75 | 1,800 | Not estimated | 87 | 2,400 | 600 |
| 75 | 1,200 | 750 | 88 | 1,800 | 900 |
| 75 | 1,080 | 540 | 90 | 1,500 | 480 |
| 75 | 1,800 | 600 | 90 | 1,680 | 750 |
| 75 | 1,500 | 600 | 90 | 1,500 | 480 |
| 75 | 1,140 | 780 | 90 | 1,500 | 240 |

SALARIES OF SUPERINTENDENTS OF NURSES AND HEADS OF NURSES' TRAINING SCHOOLS OF HOSPITALS HAVING 100 OR MORE BEDS

| No. of Beds | Monetary Salary | Monetary Equivalent | No. of Beds | Monetary Salary | Monetary Equivalent |
|---|---|---|---|---|---|
| | | *100 to 199 Bed Group* | | | |
| 100 | $1,500 | $ 720 | 142 | $2,000 | $ 600 |
| 100 | 1,200 | Not estimated | 145 | 2,100 | 480 |
| 100 | 1,200 | 600 | 150 | 1,500 | 600 |
| 100 | 1,200 | 480 | 150 | 1,500 | 440 |
| 125 | 2,400 | 720 | 150 | 1,140 | 600 |
| 100 | 1,200 | Not estimated | 150 | 1,800 | 900 |
| 100 | 1,500 | 600 | 150 | 1,800 | 1,200 |
| 100 | 1,320 | 360 | 150 | 1,500 | 1,000 |
| 100 | 1,500 | 600 | 150 | 1,980 | 720 |
| 101 | 1,500 | 600 | 150 | 1,620 | 730 |
| 104 | 1,500 | 540 | 150 | 1,600 | 2 rooms, bath. |
| 110 | 1,500 | 1,000 | 150 | 2,100 | 360 |
| 115 | 1,320 | 660 | 150 | 1,500 | 400 |
| 117 | 1,500 | 720 | 150 | 1,200 | 600 |
| 120 | 300 | 180 | 150 | 1,500 | 700 |
| 120 | 1,200 | 624 | 155 | 1,920 | 750 |
| 125 | 1,430 | 673.75 | 160 | 1,800 | B. R. and L. |
| 125 | 1,560 | 540 | 160 | 1,300 | 416 |
| 125 | 1,800 | 600 | 160 | 2,000 | 750 |
| 125 | 1,380 | 480 | 170 | 1,800 | 480 |
| 137 | 1,800 | 750 | 174 | 1,800 | 420 |
| 140 | 1,500 | 1,000 | 175 | 1,800 | 550 |
| 140 | 1,500 | 480 | 180 | 1,500 | B. R. and L. |
| 140 | 2,244 | 1,122 | 180 | 1,332 | (?) |
| 142 | 1,800 | 2 rooms, board and laundry. | 185 | 1,500 | 750 |
| | | | 192 | 1,800 | 400 |
| | | *200 to 299 Bed Group* | | | |
| 200 | $1,800 | B. R. and L. | 255 | $3,000 | Maintenance |
| 200 | 1,465 | $1,165 | 250 | 2,400 | $ 900 |
| 200 | 1,500 | 1,000 | 250 | 2,100 | 600 |
| 200 | 2,100 | 1,000 | 250 | 1,800 | 750 |
| 200 | 1,200 | 365 | 256 | 2,400 | 1,000 |
| 200 | 2,100 | 480 | 260 | 1,800 | 600 |
| 200 | 1,800 | 600 | 265 | 1,800 | 900 |
| 200 | 1,500 | 675 | 267 | 2,400 | 600 |
| 200 | 1,500 | Not estimated | 270 | 2,100 | 1,500 |
| 210 | 2,310 | 50% | 273 | 1,800 | 1,500 |
| 215 | 2,400 | (?) | 275 | 1,920 | Full mainten'ce |
| 225 | 2,175 | (?) | 275 | 1,200 | 1,000 |
| 225 | 2,500 | 550 | 285 | 2,400 | Maintenance |
| 236 | 2,500 | 1,500 | 289 | 2,500 | 750 |
| 240 | 1,800 | R. and B. | 291 | 2,000 | B. R. and L. |
| 250 | 1,500 | B. R. and L. | 295 | 2,500 | Full mainten'ce |
| 250 | 2,400 | Maintenance | | | |
| | | *300 to 399 Bed Group* | | | |
| 300 | $2,000 | .... | 350 | $1,500 | $ 900 |
| 300 | 4,000 | $360 meals only | 360 | 1,440 | 1,000 |
| 320 | 2,000 | B. R. and L. | 360 | 1,750 | 600 |
| | | *400 to 499 Bed Group* | | | |
| 400 | $1,200 | .... | 450 | $2,000 | .... |
| 404 | 2,000 | $1,500 | 475 | 2,700 | $ 500 |
| 446 | 2,000 | 400 | 476 | 2,700 | Full rate |
| 450 | 1,800 | 900 | 480 | 1,500 | 800 |
| 450 | 3,000 | 1,200 | 494 | 2,500 | 800 |
| 450 | 2,400 | 900 | | | |
| | | *500 Beds and Over* | | | |
| 500 | $2,000 | $1,800 | 1,110 | $2,310 | $1,155 |
| 500 | 1,800 | Full mainten'ce | 1,209 | 2,310 | 800 |
| 625 | 2,400 | 1,000 | 1,202 | 1,768 | 860 |
| 700 | 1,800 | 600 | 1,600 | 2,824 | 1,500 |
| 770 | 1,800 | .... | 1,800 | 1,500 | B. R. and L. |
| 850 | 2,400 | 500 | 1,837 | 2,310 | .... |
| 850 | 2,400 | 900 | 1,900 | 2,500 | 1,800 |
| 900 | 2,100 | 780 | | | |

SALARIES OF SUPERINTENDENTS OF NURSES AND HEADS OF NURSES' TRAINING SCHOOLS WHO ALSO ACT AS SUPERINTENDENTS OF HOSPITALS

| No. of Beds | Monetary Salary | Monetary Equivalent | No. of Beds | Monetary Salary | Monetary Equivalent |
|---|---|---|---|---|---|
| | | *50 to 74 Bed Group* | | | |
| 50 | 1,800 | 600 | 60 | $1,500 | $ 384 |
| 50 | 1,500 | 1,800 | 60 | 1,800 | 780 |
| 50 | 1,800 | 500 | 60 | 1,800 | 600 |
| 50 | 1,800 | 480 | 60 | 1,320 | 600 |
| 50 | 1,200 | 600 | 65 | 1,800 | 416 |
| 52 | 1,800 | 600 | 66 | 2,100 | 900 |
| 54 | 1,800 | 300 | 70 | 1,500 | 300 |
| 56 | 1,800 | 480 | | | |
| | | *75 to 99 Bed Group* | | | |
| 75 | $1,080 | $ 360 | 82 | $1,800 | $ 500 |
| 75 | 2,400 | 780 | 85 | 2,000 | 960 |
| 75 | 1,500 | 365 | 87 | 2,400 | .... |
| 80 | 1,500 | $20 | 90 | 1,800 | 720 |
| 80 | 1,500 | Not estimated | | | |
| | | *100 to 199 Bed Group* | | | |
| 100 | $1,500 | $ 600 | 100 | 1,500 | Full mainten'ce |
| 115 | 2,400 | 900 | 145 | 2,100 | 2 rooms, bath |
| 120 | 2,400 | .... | 150 | 3,000 | 2 rooms, bath |
| 150 | 2,000 | Not estimated | | | |

## CALENDAR OF PIONEER NURSES

An artistic work is the successor to the Florence Nightingale calendar of 1921, dedicated to the "Early Leaders of American Nursing," and second of a series of nursing calendars to be presented by the National League of Nursing Education.

With each month's calendar for 1922 are a quaint reproduction and a brief biography of a famous American nurse, beginning with Sister Helen, who inaugurated the Florence Nightingale system of nursing into America in her work at Old Bellevue Hospital in New York, a sketch of which decorates the cover page. Pioneer nurses to whom the calendar is dedicated include Linda Richards, Alice Fisher, Lucy Lincoln Brown, Louise Darche, Diana Clifford Kimber, Anna Caroline Maxwell, Isabel Adams Hampton, Lavinia Lloyd Dock, Isabel McIsaac, Sophia F. Palmer and Jane Archer Delano.

In choosing the twelve representative nurses for the calendar its publishers submitted a list of suggested names to a number of nurses in all sections of the country representing various associations and branches of the work. The twelve receiving the highest number of votes were selected. The best available photographs were sought and friends and associates of the women selected were asked to contribute biographical sketches.

The publication committee was composed of Isabel M. Stewart, Florence M. Johnson, Ada M. Carr and R. Inde Albaugh.

## CUBAN NURSE PASSES AWAY

Twenty-three years' service in Cuba was ended on January 22, when Miss Annie O'Brien, chief nurse of Las Animas Hospital in Havana, died after a prolonged illness. She was buried in Philadelphia, her former home.

Miss O'Brien began her work under the supervision of such eminent physicians and surgeons as General Gorgas, Drs. Ross, Lazaer, and Carroll and under the immediate direction of Drs. Mario Lebredo and Cartaya, directors of the hospital, all of whom were active in research on yellow fever and its extermination.

Born in Pennsylvania, Miss O'Brien entered Blockley Hospital for training and was graduated by that school in 1896. She became head nurse at the hospital at Lebanon, Pa., and while there, war with Spain was declared. She offered her services to the American government as a nurse and was sent to Santiago de Cuba. There she contracted yellow fever and became immune. Later she was transferred to Havana and became chief nurse at Las Animas Hospital for contagious diseases, where she served with marked intelligence and rare faithfulness, her co-workers declare. She was a life member of the Spanish-American War Nurses' order in the United States.

## GIVES REST HOME TO NURSES

A Summer Vacation and Rest Home has been given to the Training School for Nurses of the Grace Hospital in Detroit by Mrs. Helen N. Joy of that city. The property is situated on Elba Island in the Detroit River and will accommodate from thirty to fifty nurses. The residence has just been remodeled and furnished by Mrs. Joy at considerable expense and will be used by nurses from the hospital on week ends and during summer vacation periods. Several acres of gardens and large fruit orchards are a part of the property. The hospital trustees have named the place the Helen N. Joy Rest Home for Nurses.

# DIETETICS AND INSTITUTIONAL FOOD SERVICE

*Conducted by* LULU G. GRAVES,
Supervising Dietitian, Mt. Sinai Hospital, New York.

# THE COLLEGIATE TRAINING OF DIETITIANS*

BY ABBY MARLATT, UNIVERSITY OF WISCONSIN, MADISON

THE report of the sub-committee on the collegiate training of dietitians is the result of studies of college two-year and four-year courses which definitely advertise the training work as part of their curriculum, and embodies suggestions taken from detailed answers to personal letters sent to dietitians at well known hospitals who have in the past received college graduates for periods of training from three to six months. These hospitals are from the Atlantic through to Minnesota. Data from the California field were taken from Dr. Agnes Fay Morgan's report made after a detailed study of the work of the hospitals in California.

The chairman had assistance from Dr. Ruth Wheeler, Mrs. Mary De Garmo Bryan, Dr. Katherine Blunt, Dr. Amy Daniels, Prof. Helen Parsons, and Prof. Mabel Little, all of whom have either assisted in courses for the training of dietitians or have helped in training dietitians in college and in hospital work.

The report for the two-year course is a slight modification from the one presented by Lenna Cooper's committee at the Institutional Economics meetings at the University of Wisconsin two years ago. This is included in this report, at the earnest solicitation of the president of the American Dietetic Association and Miss Cooper, both of whom feel that at this time we should continue to recommend a minimum two-year course to meet the needs of the group of smaller hospitals who are unable to pay the larger salaries that would necessarily be demanded where the training of the dietitian represents four years of college with additional apprenticeship as pupil dietitian in an accredited hospital.

## Two-Year Students Are Limited

In the two-year course the outline indicates the best judgment of persons who have watched the training of the two-year group and have had experience in taking them as pupil dietitians. The need for courses in physics as well as in chemistry, biology and psychology was recognized by practically all of those who were consulted.

The one criticism that was made is that the amount of time given to food preparation is too limited, that the individual who goes from a two-year course to hospital training would necessarily have more to do with the buying and preparation of food than with the diet kitchen work, and therefore, a larger period of time should be given to perfecting the technique in cookery. The fact that cookery processes are carried on in connection with the courses in nutrition, and dietaries in diseases; and detailed study in the preparation of food in large quantities is given in the second year seemed to the chairman of the committee to have met this demand sufficiently. Technique would need to be perfected during the summer months either in the individual home or in some institution so that the routine work would become technically more nearly perfect, leaving the major time in the two years of training to the better grounding in the fundamentals of applied sciences, economics and art. Following the intern period as pupil dietitian, the graduate of a two-year course should be assigned as assistant dietitian in some hospital where the head dietitian has had the wider training. After successful work for one year, she may be sent out as the only dietitian in a smaller hospital.

## Requirements in Four-Year Course

The suggested four-year course leading to the bachelor's degree is definitely divided into groups. In each group the sequence of studies is such as should occur in a well organized course. No attempt has been made to adjust to semester or year schedules, it being felt wise to leave that to the judgment of the home economics department in the institution offering the course, the emphasis being placed on the fact that the general education in the arts and sciences should be a prerequisite to the applied work in food, shelter, dietetics, and institutional management. With the student who has not had a wide background in general education and intensive courses in chemistry, physics, biology, it would be futile to do collegiate work in applying these sciences in the study of foods, sanitation, dietetics and applied economics.

Where the students are definitely planning to do research work in connection with physicians and other research workers in the hospital, it would be advisable to include such courses in clinical medicine, as the previous training of the student would prepare her to take. Under Group H, courses are suggested in clinical laboratory diagnosis, not that the dietitian would be called upon to do this type of work, but that the dietitian must know the vocabulary and the technique and be able to understand the findings in connection with the laboratory diagnosis, so that the cooperative work with the physicians may be more intelligently developed.

The need for courses in psychology, sociology, and education is recognized by the workers in hospital fields because the native ability to handle employes and work with

*Read at meeting of American Dietetic Association in Chicago, October 25, 1921.

patients is rare. The better knowledge of human psychology and principles of education should be an asset in developing the ability of the trained dietitian to handle her problems with tact and judgment.

It is hoped that the institutions throughout the country who are offering courses for the training of dietitians may eventually be able to give graduate work to experienced teachers who are desirous of entering the dietitian field.

It has been suggested that the year of graduate study could be divided into three periods, the first of approximately three months taken during the summer vacation and the other two periods to include the nine months of resident study. The second period, beginning in the fall, may include detailed study in hospitals or dispensaries and preliminary work in research in metabolism laboratories preparatory to the second semester, which may be given to a definite research problem selected by the student in consultation with the faculty of the department and the staff of the resident hospital.

The need for better trained dietitians in our hospitals and cooperative work between the dietitian service and the superintendent of nurses and the superintendent of the hospital is becoming increasingly apparent. If the dietitian is to be given recognition as having coordinate rank in a hospital staff she must be sufficiently trained in the sciences and in her own special field to be able to know what pieces of work she may successfully develop, what types of work are cooperative and what types of work she should not attempt.

There is a field for the nurse's work, a field for the medical officer's, and one for the dietitian. They should be sufficiently separated so that there is no possibility of misunderstanding, but they should be so coordinated that the patient receives the best possible assistance in the struggle back to health. The least training that the dietitian today should receive is the work done during four years of college training, one-third of the credits of which should have been along home economic lines. In addition she should have from at least four months to possibly twelve months of work beyond her bachelor's degree; this work to be taken, in part, as pupil dietitian. Later, after a wider experience as assistant and head dietitian, she may return to college work, developing research standards in cooperation with a medical college with its group of hospitals.

## SUGGESTED FOUR-YEAR COURSE

### Leading to B.S. Degree

GROUP A—Taken as part of a liberal education (should be ⅓ of total).
- *English*—(6 semester hours required; others elective).
  - Composition and rhetoric (1 year), 6 credits.
  - Commercial correspondence, or
  - Sophomore composition (1 semester), 2 credits.
  - English literature (1 year), 6 credits.
  - Advanced courses comparative literature (1 semester), 2 credits.
- *Language*—(8 to 16 semester hours in the college).
  - Latin in high school, 3-4 years should be taken to give foundation for medical courses.
  - Advanced courses in foreign language (reading knowledge should be the measure).
- *History*—(3 semester hours required).
  - Better to take at least one year to secure knowledge of college methods in historic study—may be Ancient, Medieval, English, United States, Modern, European.
- *Art*—(2 semester hours).
  - General courses in art appreciation.
- *Economics*—(1 course required; others elective).
- *Psychology*—(3 semester hours required; others elective).
  - General (1 semester), 3 credits.
  - Social (1 semester), 3 credits.
  - Experimental or educational (1 semester), 3 credits.
- *Sociology*—(1 course on "The Family" at least).
- *Education*—Courses suited to needs of student.

GROUP B—Science as foundation for advanced study (should be at least ⅓ of total).
- *Chemistry*—(At least 18 hours).
  - General (19 credits).
  - Quantitative (3 credits).
  - Organic (aliphatic), (3 credits).
  - Food (4 credits).
  - Physiological (5 credits).
- *Physics*—(1 year), 6 credits.
  - General and applied.
- *Biology*—(1 year), 8 credits.
  - Bacteriology (4 semester hours).
    - General and applied—lecture and laboratory course.
  - Human physiology and hygiene (4 semester hours).
    - Lecture and laboratory course.

GROUP C—Food Study (Applied Science) (1-1½ years), 9 credits.
1. Selection and preparation of foods, including serving of meals. (1 semester), 3 credits—lecture and laboratory.
2. Food economics (applied economy)—(3 semester hours). Production, transportation, storage and preservation, markets, tests for quality, substitution values.
3. Experimental cookery (1 semester), 2 credits.

GROUP D—*Textile Study*—(1 semester), 3 credits.
- Textile chemistry, laundry chemistry and laboratory practice.

GROUP E—Housing and Sanitation (1 year), 6 credits.
1. Architectural plans and details, plumbing, heating, lighting, sanitation, floor and wall finishes of hospitals, halls, cafeterias (1 semester), 4 credits.
2. Decoration (1 semester), 2 credits. Study of textiles, furniture, color design suited to institutional equipment.

GROUP F—Dietetics (1 year), 7 credits.
1. Nutrition and diet (4 semester hours).
   - Dietary standards, diet as influenced by age, sex and occupation; construction of dietaries and service of meals; detailed dietary study made on self. Group dietary made at practice cottage. Study of metabolic processes; urine, feces, blood analysis and respiration tests following dietary studies. Food requirements of young children; comparative study of milk and various proprietary infants' food and formula; principles underlying milk modification in infant feeding.
2. *Diet in disorders of nutrition* (3 semester hours).
   - Lecture, reading and laboratory course.
   - A study of intermediary metabolic processes, the adaptation of diet to the disorders of nutrition.
3. Organization of teaching courses (2 credits).

GROUP G—Institutional Administration, 14 credits.
1. Organization and administration of institutions.
   - Principles of industrial organization applied to purchasing food, equipment and supplies for an institution; accounting and office records; storeroom in management and inventories; studies of service problems in management of employes; institutional housekeeping; cafeteria organization and management.
2. Large quantity cooking.
   - Practice in preparing food for large groups; cost studies in changes in weight of food due to cooking; in determining size of portion; in number of portions per pound and in cost of servings. Limited to food majors. Lecture and laboratory.
3. Institutional dietaries and catering.
   - Marketing and menu planning for all kinds of institutions, economic use of foods, catering, community kitchens.
4. Institutional laundry management.
   - Purchase, care and use of laundry equipment, use of soaps, starches and bluing; organization of work in laundry; methods of laundrying various materials; methods of checking and accounting.
5. Tea room, restaurant and hotel management.
   - Study of location, amount of capital needed, necessary equipment, organization of staff and work, menus, cost accounting and advertising.
6. Institutional equipment.
   - Principles involved in construction of institutional equipment; care of equipment; types of equipment; newest equipment on market; planning of institutional kitchens; writing of specifications for equipment orders.

GROUP H—Clinical laboratory diagnosis (1 semester), 3 credits.
- Study of metabolic processes with special reference to abnormal conditions. Analysis of normal and pathological urine, gastric contents, stools, blood, etc.

## YEAR GRADUATE STUDY

1st period—Pupil dietitian in hospital, 3 months.
2nd period—Clinics in hospital or dispensary work in research and metabolism laboratory.
3rd period—Research problem under hospital and department management.

## SUGGESTED TWO-YEAR COURSE

I. ENGLISH—(3 semester hours).
- Written and spoken English; theme writing, special emphasis being placed on outlines, note taking, writing of clear, correct English. Also the writing of social, business and professional letters.

II. CHEMISTRY—(10 semester hours).
- Inorganic chemistry (6 semester hours).
  - Properties, use and preparation of important metals, nonmetals and other compounds. Elementary discussion of chemical theory. The laboratory illustrates theoretical instructions, and lays foundation of laboratory technic. Principles of qualitative analysis introduced.
- Organic and food chemistry (4 semester hours).
  - Aliphatic and aromatic series of carbon compounds with emphasis on such parts of organic chemistry as are most closely related to food chemistry. Chemistry of carbohydrates, fats, and proteins, including qualitative analysis of typical foods.

III. PHYSICS—(5 semester hours).
- Principle of and application of
  - Mechanics
  - Heat, light } to household
  - Electricity

IV. BIOLOGY—(7 semester hours).
- *Bacteriology*—(4 semester hours). Nature of bacteria, related to public health, spread and contraction of disease, food manufacture and decomposition. Laboratory and lecture course.
- *Human Physiology and Hygiene*—(3 semester hours). Class, laboratory and demonstration on mammals.

V. PSYCHOLOGY—(3 semester hours).
- General psychology and applied psychology with experimental work as basis for better understanding of employes.

VI. ECONOMICS—(3 semester hours).
General introductory course. Lectures and readings.

VII. FOODS—(4 semester hours).
A study of foods and food composition, general principles of cookery, serving of foods. Laboratory work includes preparation of various classes of food, not only the fundamental foods but pastries, salads, entrees, and fancy desserts.

VIII. FOOD MARKETING—(3 semester hours).
Food production, transportation, storage, marketing and markets, cooperative buying and selling, price fixing and price regulation, trade discounts, trade names, and field practice in buying.

IX. NUTRITION AND DIETARIES—(4 semester hours).
Nutrition; chemistry and physiology of digestion, metabolism and its products; energy value of food; energy requirements of the body; nutritive properties and qualitative relations of protein, fats and carbohydrates and ash constituents; vitamines. Food requirements of individuals in health and through infancy, childhood, adolescence, adult life and old age, menus for the different periods of life.

X. DIET IN DISEASE—(3 semester hours).
A study of pathological conditions in various diseases and dietetic requirements to aid in their cure. Dietaries computed in grams and total calories and variations in menus planned for diabetic, nephritic, tubercular, gastro intestinal, anemic, febrile and gouty cases.

XI. HOUSE ARCHITECTURE—(3 semester hours).
Study and drawing to scale of typical floor plans and elevation of hospitals, cafeterias, lunch rooms, dormitories. Study of materials and treatment as to sanitary finishes, color schemes; kinds and installation of plumbing, heating and lighting fixtures. Estimation of cost.

XII. INSTITUTIONAL HOUSEKEEPING AND LAUNDRY—(3 semester hours).
Details of the care and cleaning of floors, walls, equipment, machinery, and detailed processes of laundry work. Selection and cost of institutional furnishings; handling and repair of household linen.

XIII. INSTITUTION EQUIPMENT—(2 semester hours).
Principles involved in construction of institutional equipment; care of equipment, types of equipment, newest equipment on market; planning of institutional kitchens; writing of specifications for equipment orders.

XIV. LARGE QUANTITY COOKERY—(4 semester hours).
Preparation of foods in large quantities; studies of cost, loss in weight, determination of size of proportion, cost of each serving, selling of each serving; menus for lunch rooms, cafeterias, tea rooms, dormitories, hospitals, and other types of institutions; economics and social feature of above menus.

XV. ADMINISTRATION, ORGANIZATION AND ACCOUNTING—(3 semester hours).
Types of institutions and systems of administration; labor problems; personnel; line of authority; labor turn-over; characteristics of employees of the different nationalities; management of help; duties of maids and janitors; other routine work of an institution household; the relation of a dietitian to an institution—her duties.
Simple methods of accounting; factors entering into retail costs of food consumed; overhead; per capita costs.
*Pupil Dietitian*—Following the two-year course the pupil should spend four months in an approved hospital or other type of institutional organization before being placed in charge of institutional work.

# THE TEACHING OF DIETETICS TO STUDENT NURSES

EVIDENCE is constantly being shown of the lack of proper training for dietitians. Since the dietitian is deficient in many phases of her work, it naturally follows that the nurse's training in dietetics must also suffer.

The American Dietetic Association is making an effort to secure better courses of training in colleges as well as in the hospital. Committees have been making a study of the situation and have made recommendations as submitted in the following reports. Another committee considering the training of student dietitians reported at the annual meeting of the American Dietetic Association.

The department would be glad to know of hospitals and colleges adopting these courses and of results obtained. In the dietary department at Mount Sinai, the principal points in the following course for nurses are incorporated though not in the order indicated.

The preliminary course is given early in the nurse's training and the advanced work in the senior year.

## Nurses Weak in Dietetics

Dietetics has always been one of the most important subjects in the nursing school curriculum, but with the recent strides in nutrition and in the dietetic treatment of disease, it must necessarily take a much larger place in the preparation of the student nurse. Without a thorough, up-to-date course in dietetics, nurses nowadays find themselves seriously handicapped in public health work and in other branches of nursing.

Reports from nursing schools throughout the country and the results of state examinations for a number of years have shown that dietetics is one of our weakest subjects. There are many reasons for this, among them lack of sufficient time, adequate equipment, good textbooks and trained teachers. But the main reason is that few of us seem to have given the subject the careful thought and study it demands. We have been content to go on with the same old cookery outline and the same teaching methods with which we started years ago, forgetting that the whole subject has been growing rapidly and that the emphasis has changed greatly in the past few years, both in subject matter and in method.

Dietitians as well as nurses are responsible for whatever failure there has been to galvanize this vital subject into life. The American Dietetic Association has shown its interest by appointing a sub-committee of its Committee on Education to cooperate with the Education Committee of the League of Nursing Education in working out a more satisfactory outline for the teaching of dietetics to nurses. The report which follows is only a preliminary study, to be supplemented later by a fuller outline of typical classes or lessons now being worked out by the members of the Dietetic Association; also lists of illustrative material, text and reference books, etc., for the use of both teachers and students.

The committee invites suggestions and criticisms from all those interested in the better teaching of this subject. The members of the sub-committee are: Lenna Cooper, Battle Creek Sanitarium, Battle Creek, Mich.; Charlotte Addison, Post-Graduate Hospital, New York; Isabel M. Stewart, Department of Nursing and Health, Teachers College, New York (chairman Education Committee of the National League of Nursing Education); chairman, Katherine A. Fisher, Department of Household Administration, Teachers College, New York.

## OUTLINE OF COURSE OF STUDY

### Preliminary Course

*Time.*
This course should be given during the preliminary period of training. A minimum of sixty hours of lecture and laboratory work is recommended; laboratory periods should be at least two hours in length.

*Instructor.*
The class should be conducted by a dietitian who is a graduate in household science from a recognized school.

*Preparation of class.*
It is assumed that the students are of high school grade. Exemption from the course should be granted to those students considered by the superintendent of nurses and the dietitian to have had the equivalent of the work given. An examination should determine such exemption, and all students should be required to take any work directly relating to cookery for the sick which was not included in their previous training.

*Laboratory equipment.*
A laboratory is essential, with facilities for individual laboratory work. Not more than sixteen students can be handled satisfactorily by one teacher in one laboratory section. Illustrative material, such as charts, slides and exhibits should be supplied and freely used.

*Aims of course.*
1. To give students a sound fundamental understanding of the principles and methods of cookery for well and sick people.
2. To make them familiar with the nutritive values of food and with the essentials of well balanced daily meals for well people and convalescents under varying conditions.
3. To help the students to appreciate thoroughly the economic aspects of food, such as selection, relative costs and control of waste.
4. To give a training in high standards of cleanliness and sanitation in the care, preparation and service of food.

5. To give practice in the planning of well balanced, attractive and suitable menus, and a training in the efficient preparation of these.
6. To demonstrate and maintain dainty and artistic service of food.

*Methods of teaching.*

1. Some instructors may wish to separate the lectures from the laboratory periods. If this scheme is followed, it is thought that fifteen one-hour lecture periods should be planned within the minimum time recommended above. The most satisfactory method, however, is the combination of lecture and demonstration by the instructor, followed by laboratory practice, investigation and discussion by the students. The students have thus a chance to directly connect, under supervision, the general principles with their methods in laboratory practice.
2. Instructors should remember that their students are nurses in training and not students specializing in home economics. Only that material, therefore, which the nurse will use during her training and in her professional work later, should find a place in the course, and it should, of course, be presented with a view to constantly holding her active interest. "Fancy cookery," as such, has no place in this course. Dainty and effective garnishes should be taught and interesting variations from the typical dishes considered, but dishes involving such time and elaborate arrangement of ingredients should be excluded.
3. The introductory lessons should bring the students into immediate touch with the actual work of food preparation instead of being entirely devoted to the less interesting phases of laboratory practice, such as a study of equipment and fuels, and it is not desirable to devote the greated part of these first lessons to the theoretical side of the subject. The students should think in terms of the daily food service to patients on all kinds of diet, and it is considered wise to base as many of the lessons as possible on the preparation of an entire meal and the setting up of trays. This plan gives the students practice in applying their knowledge of food values to the planning of the day's diets and the instructor an opportunity to bring to the attention of the class concrete examples in diet and the problems to be met in planning attractive, palatable and well balanced menus. Problems representing suitable meals for persons under specific conditions, such as meals for children of different ages, for adolescents, for adults and the aged, should be worked out by the class instead of asking them to consider isolated masses of facts concerning food values and food preparation. Methods of cooking should be studied as they are first used and later a summary and comparison made of the various methods, as to their effect on the flavor and digestibility of food.
4. In conducting classes the instructor should lay the emphasis on the reason for following the various methods, on "why" as well as on "how" and "what." This will keep live questions constantly before the students, making them stronger in technique, more resourceful, and capable of thinking independently in this field. In all review work questions given to the class should reflect this more desirable method of teaching, and it is of the greatest importance that the actual needs of the nurse in her later professional work should be given the closest attention.
5. Standard or basic recipes should be used freely and the students instructed in varying these as necessary. This should give them a knowledge of general principles and of proportions in food combinations and eliminate the memorizing of recipes, a practice which cannot be condemned too strongly. For example, using as a basis the standard recipe for cream sauce, a cheese sauce for macaroni may be made and the various cream soups prepared. General principles of cooking the various typical groups of food should be stressed in the laboratory work.
6. Students should be trained in the critical judgment of the finished dishes and of the meals prepared and served. There should be constant comparison of class results by the instructor and students and for this they may work out score cards. For example, a *baked custard* may be scored on this basis:

| | Possible Score | Actual Score |
|---|---|---|
| Appearance | 1 | |
| Consistency | 2 | |
| Texture | 4 | |
| Flavor | 3 | |
| Service | 3 | |
| Immaculate service | 1 | |
| Artistic arrangement | 1 | |
| Convenience for patient | 1 | |
| Menu | 7 | |
| Suitability to patient's condition | 2 | |
| Combination of foods | 2 | |
| Palatability and digestibility of food | 3 | |

7. Class notes should not be voluminous. They may be conveniently arranged on cards, indexed for reference purposes, and should be carefully corrected by instructor. A good textbook and suitable reference books relieve students from much note taking, but at present there appears to be few suitable books of this kind for student nurses. Some are, for the most part, a collection of recipes, while others pay too much attention to specific methods and specific information, with inadequate attention to general principles. The material presented is not always well adapted to the average general educational preparation of the class and to their vocational needs.
8. The attention of students should be frequently drawn to the various ways in which this work is related to nursing education and opportunities for applying this part of their training as students in the hospital and later in their professional work. The growing tendency, in medicine and nursing, to pay more attention to the dietetic treatment of disease should receive full consideration.
9. The social and economic aspects of the food problem should also be kept before the class. Many of these nurses will be working later with poorer families and will be expected to advise them about the choice and the relative costs of standard foods.
10. The instructor should keep closely in touch with the other preliminary courses most directly related to the work in dietetics, so that she may know how to correlate her work with these to the very best advantage. Instructors should also keep in touch with the latest developments in nutritional work and familiarize the students with the various sources through which they may keep their knowledge up to date.
11. The principles of physical science should be woven into the course in a popular way, to give the reasons for certain procedures in cookery which other courses in the preliminary work do not cover.
12. The content of a course in dietetics for nurses has already received much thought, but the methods of teaching have not been given adequate attention. Students are therefor not always well prepared to use this training to the best advantage.

*Content of course*

(These subjects are not arranged in the sequence in which they would be presented in a course of study, nor are they divided into lessons. Such an outline will be submitted later, following the suggestions discussed above.)

1. Review of the physiology of digestion, absorption, assimilation and excretion.
2. Classification of foods and food products under typical food groups according to their place in the diet and to their economic value, as for example:
   - A. *Milk*—Important as a source of energy, protein, lime, and vitamines, unique as sufficient in growth-promoting food. Study of grades of milk.
   - B. *Cereals and cereal foods*—Economical source of protein, but not well balanced in salts and vitamines; typical starchy foods.
   - C. *Vegetables and fruits*—Varying greatly as sources of energy, but rich in vitamines.
   - D. Typical *protein foods* and food products:
     1. Meat, fish and poultry—generally popular, but expensive as sources of protein and fat. Poor in lime and in vitamines.
     2. Eggs—rich in protein, salts and vitamines; value in the dietary depends much on market conditions.
     3. Cheese—valuable as a meat substitute in concentrated form.
     4. Nuts—rich in protein and fat; valuable as a meat substitute.
3. Food values and their measurement; practice in computing food values.
4. Composition and food value of the different foods; specific functions of
   (1) Proteins (4) Salts
   (2) Fats (5) Vitamines
   (3) Carbohydrates (6) Water
5. Factors in food requirements such as age, climate, activity, size, etc.; consideration of suitable diets for persons under these varying conditions.
6. Preparation of foods:
   - A. Selection, cooking and serving of typical protein and carbohydrate foods and of the fats and oils:
     1. *Fruits and vegetables*—Dried and fresh, greens and legumes.
     2. *Cereals and cereal foods*—Including gruels, breakfast cereals, macaroni and rice. Comparison of ready to serve and home cooked cereals as to cost and food value.
     3. *Eggs, milk and milk products*—Including sterilization and pasteurization of milk.
     4. *Fish*—Baked, boiled and broiled fish; shell fish.
     5. *Meat and poultry*—Broiled chops and steaks, squabs and chicken; broths and beef juice.
     6. *Fats and oils*—Their use in cookery; commercial preparations.
   - B. Preparation of the typical food combinations:
     1. *Beverages*—Including albumenized drinks, and milk and egg drinks.
     2. *Thickened liquids*—The use of the prepared starches, especially cornstarch and flour, in making cream soups, purees, sauces and desserts; basic recipes for these dishes with practice in varying them as to thickness, flavor and ingredients; method of using eggs with the starches in thickening liquids.
     3. *Flour mixtures*—Study of lightening agents; basic recipes for biscuits, muffins and plain cake, with methods for simple variations; sponge cake.
     4. *Salads*—Illustrating the serving of different foods and suitable combinations of these; salad dressings.
     5. *Gelatine dishes*—Basic recipes for the plain jellies, sponges and creams, with the simple variations.
     6. *Frozen dishes*—Types and their variations; freezing small quantities.
7. Food sanitation—handling and care of food, especially of milk; care of kitchen utensils and equipment; brief study of the sanitary aspects of commercial food distribution and preservation.
8. Methods of cooking—their effect upon the digestibility and flavor of food.
9. Use and abuse of condiments.
10. Hospital diets—use of liquid, light and full diet, with general procedure in feeding the sick.

*Practical work in the diet kitchen.*

1. It is coming to be generally recognized that the diet kitchen is a laboratory where the student nurse may apply her technical knowledge and where she may develop a fair degree of skill in preparing food for the sick. The student is there to be taught and must not be thought of simply as a means of getting the work done.
2. The duties of student nurses in the diet kitchen should not involve any needless repetition, and their services should not be used for the routine of dishwashing and other cleaning, or for much preparatory work, such as paring vegetables, washing greens, etc. Maids should be employed for this purpose.
3. Students should have some of their diet kitchen experience during their preparatory course or soon after, so that they may apply at once the elementary principles and procedures outlined above. This period should be for at least three or four weeks,* the time of each student being carefully organized so that she may have practice in the preparation of all typical dishes included in above outline. This should prepare her to assist in the preparation and serving of the simpler ward diets.

*Preparatory students are usually on practical duty not more than three to four hours daily. If the students are on eight-hour duty, the total period in the diet kitchen should be shortened accordingly.

4. Later, when she has had more opportunity to study different types of disease and to care for more complicated cases, she will take up the preparation of special diets and formulae for infant feedings as outlined in the more advanced course below.

### DIETOTHERAPY
### Course of Study

*Time*

A minimum of 20 hours is recommended, or 30 hours if infant feeding is included.

It is thought advisable that this course should be given as soon as possible after the preliminary training and, if arrangements can be made to have the students receive this instruction during the time they are taking their training in medical nursing, they will be able to use their knowledge to the best advantage.

*Instructors.*

The dietitian should be a graduate of a recognized school, fully qualified to meet the requirements of special hospital dietary work. The medical phases of the subject may be given by a physician who is a specialist in this field.

*Aims of course.*

1. To apply the principles of cookery and of nutrition to the dietetic treatment of nutritional disorders.
2. To teach the students how to fill doctors' dietary prescriptions and to make attractive menus and palatable meals from these.
3. To teach the students how patients may be led to understand the purpose of their dietetic treatment in order that they may cooperate more fully with the physician and nurse.
4. To study the charting of diets on history sheets.

*Methods of teaching.*

As the student nurse will have an opportunity for practice in preparation of diets in the diet kitchen, it is thought that less than half the time devoted to this course should be given to laboratory practice. As each type of diet is being considered, trays, demonstrating suitable menus, should be prepared and used as a basis for lectures and for discussions by the students.

*Content of course.*

1. Principles in the dietetic treatment of disease, with special reference to diseases of metabolism, and other conditions requiring special diets.
2. A study of the various types of diets as they are used in treating various diseases, using each as a basis for planning attractive menus and preparing palatable meals for patients:
   (a) Starch free diet.
   (b) Fat low diet.
   (c) Protein low diet.
   (d) Purin free diet.
   (e) Salt free diet.
   (f) Diet with restricted or forced fluids.
   (g) High calorie diet.
   (h) Diets with roughage.
   (i) Diets as free from roughage as possible.
   (j) Various combinations of above diets.
3. Practice in filling dietary prescriptions, computing caloric values of special diets when necessary, and charting.
4. Infant feeding—modified milk and doctors' formulae—technique of milk room, such as care of feeding bottles, use of Babcock tester, etc.

*Practical work in wards and diet kitchen.*

1. When the student nurse is experienced enough to be assigned to the position of chief diet nurse in the medical or surgical wards, it is desirable that her time should be divided, if possible, between the wards and diet kitchen, in order that she may study the patients' individual needs, prepare under supervision the diets for the special cases, and follow closely the effects which are produced by the treatment.
2. In the same way, her service in the milk room should, if at all possible, be a part of her service in the children's wards, so that she may know the condition of the babies and watch from day to day the results of the formulae they are getting.
3. As an instructor of nurses, the dietitian or her assistants should, through visits to the wards, keep closely in touch with the diet work of the student nurses there. In the larger hospitals, where the dietitian has charge of the administration of the dietary work throughout the entire hospital, she should, of course, have adequate assistance for the supervision of the work of the diet kitchen and for the training of student nurses. Here also the pupil dietitians should get their training in supervising special diet work.

*Post-graduate work.*

Special problems of food and nutrition in public health work and in institutional administration should be considered as post-graduate study. The social service dietitian is best qualified to give instruction in the former, and the administrative dietitian in the latter. Nurses who wish to specialize in metabolic work should also plan to take post-graduate training.

## THE DIETITIAN IN THE HOME

The future of the consultant dietitian in the home is a promising one and should have a place in the medical world, says Miss Blanche M. Joseph, field dietitian of the Michael Reese dispensary in Chicago, in a recent article in *Hospital Social Service*. A food prescription filled in the kitchen laboratory, she says, will some day hold as an important place with the physician as the prescription filled by the pharmacist. As in other professions, the dietitian should be paid for her services according to visits. The amount can only be determined by the experience and background she possesses.

A visiting dietitian must go into the home, Miss Joseph declares, with the spirit of imparting to the patient the necessity of keeping the exact diet as prescribed, to prepare the food according to formula given, to aid the patient, or whoever is responsible, in preparing the food and to show them how to calculate the caloric value.

## A SIMPLE METHOD FOR WASHING BRAN*

By FLORENCE H. SMITH, B.S., and W. D. SANSUM, M.D.

THE standard equipment of an electric mixing machine may be used for the washing of bran. Washed bran is used very extensively in the various bread substitutes for diabetic patients. The usual method of washing bran in cheesecloth bags under running water is a slow process and often fails to free the bran from starch even after many hours of monotonous work. There are a number of commercial products on the market but, due to the difficulties of production, these are expensive.

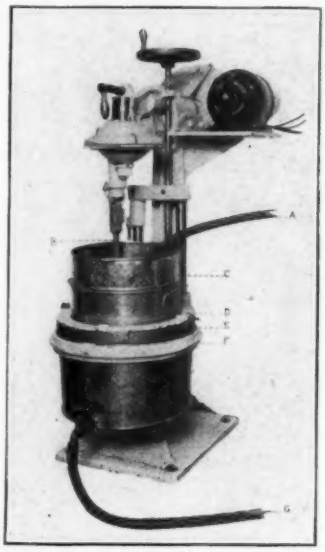


Fig. 1. Electric mixing machine (Read) with the necessary parts assembled for the washing of bran. A. Water inlet. B. Brush beater. C. Puree sieve bowl with six-inch extension. D. Thirty-quart ring. E. Water bath. F. Sixty-quart ring. G. Water outlet.

After unsuccessful attempts with various types of clothes washing machines it became evident that friction in the presence of a supply of running water was necessary to remove the starch from bran. The brush beater and puree sieve on an electric mixing machine in the presence of running water eventually proved very satisfactory. A Read machine was used in this instance, but other types are adaptable.

The various standard parts are assembled as shown in Fig. 1. The water inlet connects with a faucet. The puree sieve mesh is twelve to the inch. The regular faucet of the water bath is replaced by one large enough to accommodate a one and one-half inch hose. Fig. 2 represents the brush beater. The sieve bowl is filled with bran. The water is turned on and the bran thoroughly wet befor the machine is started. Ten minutes' work on the machine at medium speed is usually sufficient to free the bran from starch. The bran is tested for starch with Lugol's solution. A sample of the bran is boiled with water in a test tube and a few drops of Lugol's solution added. The presence of starch in very small traces gives a blue or blue black coloration. When the bran is starch-free by this test it is placed in strong sacks and sent to the hospital laundry, where it is dried in the tumbler. Bran prepared in this way keeps indefinitely and has a very fine, fresh odor.

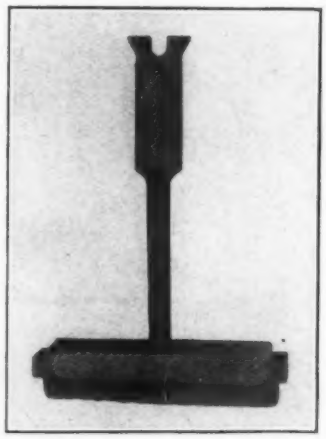


Fig. 2—Brush beater.

*From the Potter Metabolic Clinic of the Santa Barbara Cottage Hospital, Santa Barbara, Cal.

# HOSPITAL EQUIPMENT AND OPERATION

With Special Reference to Laundry, Kitchen and Housekeeping Problems

*Conducted by* FRANK E. CHAPMAN, Director
Mt. Sinai Hospital, Cleveland, Ohio

# LIGHTING THE HOSPITAL

BY REGINALD TRAUTSCHOLD, M.E., THE SOCIETY FOR ELECTRICAL DEVELOPMENT, INC., NEW YORK CITY

IN SPITE of the apparent complexity of hospital lighting, due to the many exacting and distinctive requirements for certain specific departmental needs, the modern hospital building presents unusually favorable conditions for the installation of efficient and highly effective lighting systems. The lighting of the various departments necessitates individual consideration, it is true, but present day illumination knowledge makes it a multiplicity of problems, which individually are not difficult of solution, rather than any very complicated one. Each problem entails the four recognized steps in the design of any general lighting system: First, decision as to the foot-candle illumination required; second, selection of the type of lighting unit best adapted to the location and for the purpose intended; third, determination of the location of outlets, the mounting heights and number of lighting units required; and fourth, calculation of the size of lamp which will provide the foot-candle illumination desired—and the procedure in the case of the more general departments is now pretty well standardized.

## *PROBLEMS OF ILLUMINATION*

*Has the artificial illumination of your hospital been carefully worked out by mathematical calculation or is it simply an ill-considered adaptation of the lighting systems in use in the majority of public buildings? The illumination of a hospital brings many exacting requirements and presents problems peculiar unto itself. Each separate department demands individual consideration. Local lighting for individual beds, for instance, furnishes a dual problem in obtaining the best type of illumination for the patient's reading and in answering the doctor's or nurse's requirements for attending him. An expert on lighting problems gives, in the accompanying comprehensive article, some scientific facts on lighting the hospital which are worthy of your study and application.*

For example, in the wards, which are relatively large rooms for the accommodation of a number of patients at the same time, a threefold problem is presented with ordinarily very favorable conditions for meeting all requirements with simple, effective and economical installations. First, a general illumination has to be provided which will be ample for the performance of all regular routine duties by nurses and doctors and for visitors to the wards to move about freely. A well diffused system of general illumination is needed. Second, local lights should be provided at the head of each bed so as to enable the patients to read without eye strain, which may also be used at night when the doctors or nurses require a relatively high degree of illumination to care for the patient. Third, a system of night lights is necessary to allow nurses to find their way about and exercise the necessary supervision after the general ward illumination has been extinguished for the night.

The general overhead lighting system should provide a very uniform illumination of well diffused light and at the bed level, which may be taken as two and one-half feet above the floor, an intensity of two or three foot-candles should be attained. The acceptance of an illumination standard of say two and one-half foot-candles at the bed level establishes a satisfactory and definite basis for planning the general lighting system. The next step is to decide upon the type of lighting unit. As diffused illumination is essential, as all possible direct glare and reflected glare must be avoided and as a high quality in respect to shadows, making them soft and luminous is necessary, the choice of lighting unit is pretty definitely limited to those of the totally and semi-indirect lighting type, with the preference favoring the former.

With indirect lighting, the proper location of outlets is determined by the mounting height of the lighting units and it is upon this one step in laying out the general overhead lighting system that the success or failure of the whole installation in no small measure depends. With the bed level taken as two and a half feet above the floor, the mounting height of the lights—i.e., the distance to the top edge of the lighting unit reflector—should be equal to three-quarters the distance between the bed level and the ceiling plus the bed level elevation. That is, the drop of the reflector should equal one-fourth the distance between the ceiling and bed level. With the mounting height thus established, the spacing of outlets in rows and the distance between rows of outlets can be made once and a half the distance between the bed level and ceiling with the assurance that the light emitted by the lamps in an indirect lighting unit so installed will be very uniformly distributed over the area illuminated. The distance between outer rows of outlets and side walls should be made not more than one-half the spacing distance and preferably about one-third.

A well lighted reception room.

To illustrate perhaps more plainly the proper location of ceiling outlets, the requirements for a hospital ward sixty feet long and forty feet wide with a ceiling height of twelve and a half feet may be taken as an example. The bed level being two and a half feet, the proper mounting height of the units would be seven and a half feet above the bed level, ten feet above the floor, or the reflector drop two and a half feet. The permissible spacing distance between outlets would then be ten and three-quarter feet and the distance between outer rows of outlets and side walls not more than five feet and preferably nearer three feet. Consequently, three rows of five outlets each would be required, with the distance between outer rows and the side walls of three and seven-eighth feet and between the end outlets of the various rows and the end walls of three and one-eighth feet.

## Must Exercise Care in Location

If for any reason the proper mounting height proved unsuitable, necessitating an increase in height—decreasing the reflector drop— the outlets must be brought closer together and more of them installed in order to secure a uniform illumination; the decrease in spacing being about proportional to the decrease in reflector drop. On the other hand, any greater reflector drop will produce a less satisfactory distribution of the light which is difficult, if not impossible, to overcome.

With the outlets located and the mounting height of the lighting units established, the type of lighting unit having been selected, a wide range in intensity of very uniform and satisfactory lighting can be obtained by simply installing the necessary size of lamps. This desirable flexibility of illumination is dependent, however, upon the correct location of the outlet and satisfactory mounting height of lighting units, so it is quite imperative that care be exercised in the location of the lights if proper illumination is to be secured. If this has been done—it is of necessity a preliminary undertaking—the selection of the proper size of lamp to supply any desired degree of illumination is a matter susceptible of mathematical determination.

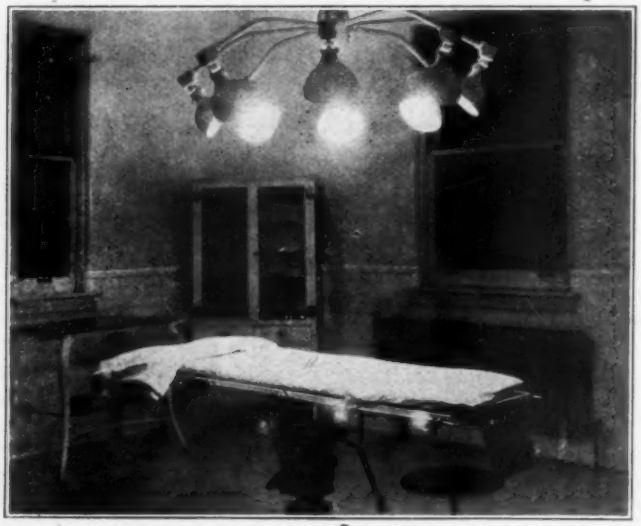
The area in square feet served (illuminated) per outlet should first be calculated and then the necessary lumen output required per square foot of area for providing the desired intensity of illumination. This latter measure is simply the product of the measure of illumination in foot-candles multiplied by the ratio of a suitable depreciation factor divided by the coefficient of utilization, but this ratio is quite a complex one, being influenced by a number of factors which, though determinable, necessitate considerable familiarity with illumination problems for their proper valuation.

## How to Estimate Depreciation

The depreciation factor is an allowance made for depreciation due to aging of lamps, accumulation of dirt and dust and the deterioration of the reflecting value of the lamp walls and under the conditions usually to be found in a well conducted hospital may be taken as 1.30. The valuation of the other influencing factor, the coefficient of utilization, however, is a much more complicated matter and can only be arrived at accurately when there is a full knowledge of existing conditions and when reliable statistical data pertaining to the science of illumination is available. It is a measure of that proportion of the light generated which reaches the place under consideration—the bed level, in this case. It is influenced by the type of lighting unit employed, the proportions of the room, mounting height of the lighting units and the color and reflecting value of the walls and ceiling. Even in the well appointed hospital wards, it may vary between such wide limits as from 0.10 to 0.50, so any method of approximating the coefficient of light utilization or the lumen output required for securing a certain desired intensity of general illumination is risky.

As it is quite out of the question to publish all the necessary statistical tables required for calculating the coefficient of utilization for any hospital wards, the approved procedure is best demonstrated by the consideration of some specific and typical example. For instance, the computations involved for wards similar to those referred to in discussing the location of ceiling outlets—one sixty feet long and forty feet wide with a ceiling height of twelve and a half feet and a mounting height for indirect lighting units of ten feet, the ceiling outlets on ten and three-quarter foot centers—will serve for the purpose of illustration.

It may be assumed, also, that the indirect lighting units employed are of the enameled type with bowl-shaped suspended reflectors, that the ceiling is smooth and light and the walls hard surfaced and fairly light in color. Under such conditions, which should be quite typical of well appointed hospital wards, the coefficient of light utilization would be 0.37 in a room of the dimensions

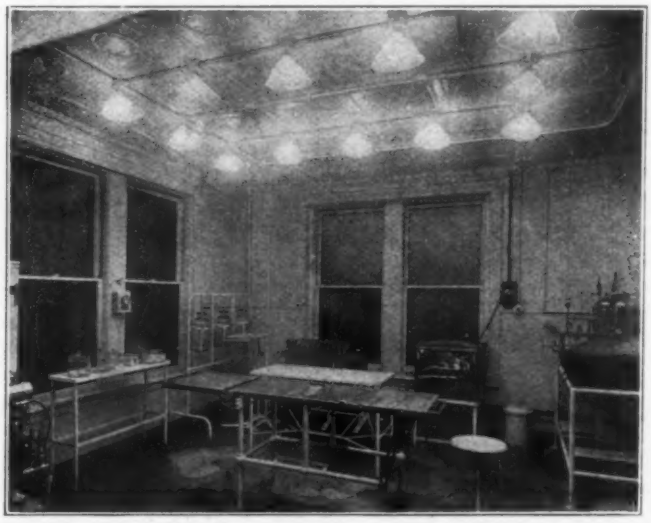


Special lighting fixture for operating table.

specified, with the light sources seven and a half feet above the bed level. Taking the depreciation factor as 1.30 and the desired intensity of illumination on the level of the beds as two and a half foot-candles, the lamp lumens required per square foot of floor area would be between eight and nine (2.5x1.30/0.37). As each of the fifteen outlets provided would have to serve some 160 square feet of floor area, the lamp lumens required per outlet would be probably between 1,200 and 1,400. Three fifty-watt lamps per lighting unit would give a gross lumen output of some 1,440 which, allowing for a certain unavoidable interference of light, due to three light sources being in close proximity, would probably be about right. A more economical installation would be, however, the use of a single 100-watt gas filled lamp for each lighting unit. Such a lamp has a lumen output of 1,260 and consumes only two-thirds the electrical energy needed for the three fifty-watt lamp cluster.

The local lighting for the individual beds should be furnished from wall brackets over each bed or between the beds located at some convenient height—say five feet, or so, above the floor level—and quite obviously considerable latitude exists as to proper size of lamp, the chief requirement being to furnish sufficient illumination for the patient's comfort and convenience. As the illumination standard for the patient's reading requirements is apt to be very different from that desired by the doctor or nurse attending the patient, a form of wall bracket with two receptacles should be employed for these local lighting units. The upper receptacle may contain the lamp for the patient's requirements, which should be furnished with an opalescent reflector for concealing the source of light and directing the light on the bed. The second, or lower, receptacle may then serve for the accommodation of a special lamp, portables, heating appliances or such electrically operated instruments as may be required.

The provision of proper night lighting, though of necessity quite subdued, should be just as carefully planned as the provision of the general illumination for the evening hours. There are three quite customary ways of providing the night illumination, which will be satisfactory, as a rule, if of about one-tenth the intensity of the general illumination—first, by low wattage lamps installed in the indirect lighting units furnished the general illumination, but wired on an independent circuit; second, by lamps placed in the floor within suitable reflectors covered by heavy clear glass which direct the light to the ceiling from which it is diffused downward; and third, by louvers lighting units of low wattage set in the baseboard between beds which cast a beam of light along and onto the floor between the beds.



Operating room lighted by twelve seventy-five-watt bowl enameled daylight lamps.

Ward illuminated by indirect lighting units.

The plan of installing low wattage lamps in the indirect ceiling lighting units is probably the most economical in first cost and is the one most usually adopted. The lamps for night lighting should emit only about one-tenth as much light as those employed for furnishing the general illumination, or, as is perhaps more general practice, an allowance of one-tenth watt per square foot of area served by each outlet may be made. The lumen output per outlet required for night lighting of wards similar in dimen- illumination to those which were used to illustrate the sions and location of indirect lighting units for general selection of proper size of lamps would be about 120 or slightly more. The lumen output of a fifteen-watt lamp is 125, so this is the size of lamp which would prove most satisfactory for the purpose. As the light from each outlet would have to serve some 160 square feet of floor area, about the same size of lamp for night lighting would be indicated by the more approximate method allowing one-tenth watt per square foot of area served.

If floor lighting units directing the light to the ceiling are employed for night lighting the location of the units should conform as nearly as possible to the location of the ceiling outlets—that is, in number and spacing—in which case about the same size of lamps should be employed as in the case of the night lights in the indirect lighting units serving for general illumination.

Extra lighting units are needed for the nurse's desk and chart rack and these should be well shaded so as to avoid annoying the patients by their brilliancy. A portable desk lamp equipped with a reflector throwing the light down on the records or work serves admirably in one case, while for the chart rack a wall bracket light fitted with a reflector directing the illumination onto the racks proves quite satisfactory. The medicine closet, also, should be provided with a suitable light.

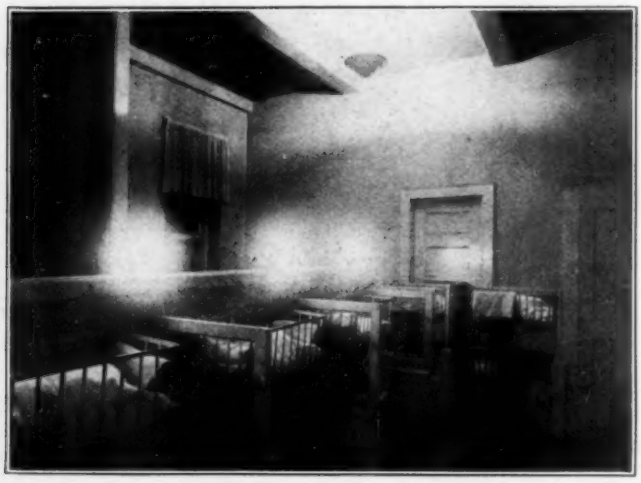
Utility rooms for the care of apparatus and the dressing rooms which are frequently located near the wards should be well lighted, preferably by a ceiling light—one lighting unit usually being sufficient, as the rooms are small—with local lighting units over the sinks, sterilizing apparatus and utility desks. In such rooms, as well as throughout the hospital, base-board and wall receptacles should be provided in adequate numbers, for they are in-

valuable for the accommodation of the numerous electrical appliances found of such great convenience in the hospital.

The proper lighting of private rooms presents much the same problem as found in a well-appointed bedroom complicated by the need of additional hospital facilities. A well diffused general illumination from an overhead lighting unit should be provided, controlled by a wall switch near the entrance to the room. Indirect lighting very similar to that recommended for the general wards proves most satisfactory if the ceilings of private rooms are suitable for efficient light reflection, or semi-indirect lighting may be employed. If indirect methods of lighting are not practical for any reason, overhead direct lighting units must, of course, be installed, but in such case they must be provided with suitable diffusing media.

The intensity of illumination need not be quite as high as that advisable for the general wards, but, as in the case of home lighting, no very definite standards can be advanced. The chief requisite is the attainment of a well diffused general illumination—not too bright, but sufficient for all ordinary requirements. Supplementing this general illumination, there should be light from wall brackets or table lamps near the bed and extra outlets should be provided for the attachment of additional lamps and special appliances, just as in the case of the general wards.

The illumination of the corridors and passageways throughout the hospital proper—that is, between wards, operating rooms, laboratories and other working rooms —need not be quite as high as that of the general illumination in the wards, as sufficient light to permit of easy passage will suffice. This calls for an illumination of from one to one and a half foot-candles, against two or two and a half. Overhead lighting, either of the indirect or direct variety, should be provided, and, as such passageways are relatively narrow a single row of centrally located lighting units will serve. The spacing of the units depends upon the mounting height of the lights, which should be quite high to assure plenty of clearance for passage and the avoidance of possible glare, but it may be made somewhat greater than in more spacious rooms. In fact, in the ordinary corridor the spacing of lights may be made equal or even somewhat in excess of twice the mounting height of the units and still secure a reasonably uniform illumination, the relatively close hard surfaced, smooth and usually light walls serving to reflect and diffuse the light up and down the corridor. With this one modification of permissible increase in spacing distance of lights, the determination of lamp sizes and other commutations entailed in the planning of the corridor lighting system are similar to those followed for lighting systems in the general wards.



General and supplementary lighting in the hospital.

The proper lighting of operating rooms, naturally of first importance in any hospital, entails the utilization of the full knowledge of the illumination expert and cannot well be discussed constructively in general terms. However, the problem is not beyond the limits of definite, logical solution. The first consideration is a determination of the intensity of illumination required, just as should be the case in planning the lighting system for any installation. A high intensity of illumination is essential—thirty to fifty foot-candles, or even more being desirable —for lighting the operating table and this must be well diffused and of the proper color to enable the surgeon to distinguish between veins, arteries, bile ducts, healthy and diseased tissue and the many anatomical details the skilled operator must recognize instantly.

This all calls for the most careful planning in the natural daylight illumination of the operating room, so the proper artificial illumination of such rooms calls for the most approved and effective methods known to the illuminating expert. For daylight operations, well diffused north light is recognized as essential, and consequently, the proper artificially lighted operating room should approximate to the utmost the illumination requirements demanded for correct natural illumination. Difficult as such a problem is, it is a definite problem susceptible to a satisfactory solution if the various influencing factors are rightly valued and combined.

The quality of north light must be matched in color and in diffusion, the light properly directed and a suitable intensity of illumination secured. These are the chief essentials. Unmodified light from the modern incandescent lamp contains somewhat excessive color rays from one end of the daylight spectrum and is lacking in color rays from the other end. To overcome this difficulty correction is made by causing the emitted light to pass through colored glass bulbs, daylight lamps, or through suitable color screens. In this way, a very close match to north light is secured, but at a certain sacrifice in lamp efficiency. That is, daylight lamps and screened lamps have a lower coefficient of utilization than do clear bulb lamps of the same wattage, necessitating the employment of more powerful lamps.

Diffusing glassware and suitable reflectors are needed to secure the necessary diffusion of light, but as the mounting height of the lamps is comparatively low—usually about ten feet above the floor level—diffusion is materially improved by the employment of a number of light sources throwing the light in different directions. An excellent arrangement is to mount the lamps, fitted with suitable angle type prismatic reflectors, at an elevation of about ten feet and in the form of an open frame, usually rectangular four feet by eight feet), with the lamps spaced about two feet. The lamp reflectors in such arrangement should be trained so as to direct the light on the operating table. With light already fairly well diffused by the use of bowl-enameled lamps or by passage through diffusing glassware, thus coming from a dozen different directions and focussed upon the operating table, the resulting illumination is thoroughly diffused, objectionable shadows eliminated and there is no trouble from either direct or reflected glare. With a lighting fitting such as described and of the dimensions given, the use of seventy-five-watt bowl enameled daylight lamps in the twelve prismatic reflectors will give light intensities of from forty to fifty foot-candles on the horizontal plane

of the operating table, twenty to thirty foot-candles on forty-five degree planes and from ten to twenty foot-candles on vertical surfaces above the table—intensities almost ideal for the most delicate and complicated operations.

If the operating room is a small one devoted exclusively to the surgeon's use, the proportion of light transmitted by the prismatic reflectors will usually suffice for the general illumination around the sides of the room, making unnecessary the provision of supplementary illumination, but if the operating room is also an auditorium for holding clinics with demonstrations, additional illumination is essential. In such cases, the general lighting of the large room can be satisfactorily accomplished by the installation patterned somewhat along the lines suggested for lighting the general wards during evening hours.

Hospital laboratories present another problem in lighting which can be discussed in only the most general terms, on account of the great variety of uses for which they may be intended.

However, the same general rules for planning effective lighting systems apply and knowing the conditions and requirements the problem is no more complicated than that found in the wards. The first essential is simply to know the intensity of illumination desired for the general illumination, knowing which, the supplementary lighting can be planned without difficulty. As laboratory work customarily entails experiments necessitating the careful observance of evaporation, filtration, titration and similar processes, good general lighting is quite necessary, as well as adequate local lighting of benches, etc. The general illumination, sufficient also for lighting refrigerating and sterilizing apparatus, drying ovens and other hospital equipment, is advisably one of an average intensity of ten foot-candles at the bench level. Local lighting intensities naturally vary, but being supplied by supplementary lighting equipment can be readily adjusted to meet requirements. The chief essential is the provision of plenty of convenient outlets, a provision which should be made as well throughout the hospital. These outlets are all important, for if the general lighting of the various rooms is properly provided, supplementary and extra illumination is a very simple matter if convenient outlets are available for plugging in portables and special fittings.

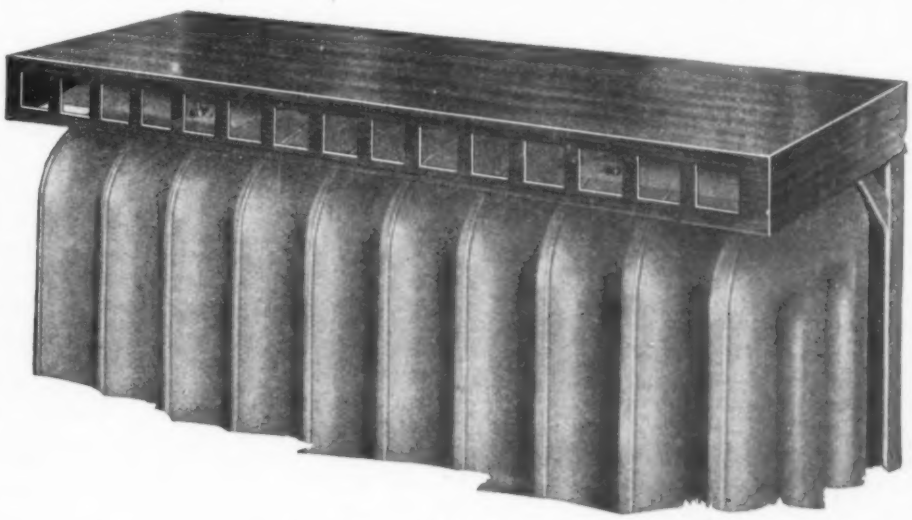
The lighting of the lobby and reception rooms, which should never be overlooked, despite the greater importance of having the working room properly illuminated, should be soft, restful and pleasing. All possibility of glare should be eliminated, necessitating the thorough diffusion of light and the location of light sources, so far as possible, outside normal lines of vision. This is usually best secured from overhead illumination and the same general rules for installation planning govern as in the hospital proper, with the addition that more attention and importance may be placed upon decorative and artistic features of fixtures. An illumination of from four to six foot-candles at a table plane will prove both cheery and restful. Desks should then be provided with supplementary illumination and a few floor lamps or portables will add a homelike touch.

That most valuable of our modern institutions—the hospital— should be provided with all possible comforts and conveniences, as well as being equipped to render service most effectively, and probably there is no better and effective manner of realizing this than through adequate and proper illumination.

## A NEW STEEL RADIATOR COVER

Although many types of radiator covers and shelves have been devised, most of them have been expensive and complicated or else lacking in the necessary durability. Recently there has been introduced an all-steel radiator cover, which is not only reasonably priced but seems to meet all necessary requirements. Furthermore it is endorsed by heating engineers.

Hospital superintendents have long noticed that curtains and walls directly above radiators are easily soiled. This is because particles of dirt and dust are carried in the air circulating through the radiators, and some of them deposit themselves on the walls and hangings. The new radiator cover overcomes this trouble by means of a back shield and deflecting plate, which assist rather than hinder the circulation of warm air. Furthermore, the cover transforms the ordinarily unsightly radiator into a convenient shelf, table or window seat.



The radiator cover is made throughout of furniture steel with a two-inch flange on all four sides, the front flange being open so as to assist radiation. The corners are electrically and acetylene welded so in reality the cover is one solid piece of steel. Naturally the covers are not furnished in stock sizes, but are built to fit any type and size of floor or wall radiator. They are finished to match the furniture or wood trim of the room, while the frame, back shelf and deflecting plate are finished to match the radiator.

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The Service Bureau on Hospital Social Work, directed by Miss Ida M. Cannon, has compiled a new and complete directory of the social service departments in the hospitals of the United States and Canada. This directory will be printed and issued as a regular bulletin of the American Hospital Association to institutional members. It is probable that additional copies will be printed and made available to non-members at a nominal price, it is announced.

# SURGICAL INSTRUMENTS OF TODAY

By MAX THOREK, M.D., Surgeon-in-Chief, American Hospital, Chicago

THAT surgical instruments offered the profession today often fail to give the satisfaction which should reasonably be expected of them is a fact well known to almost every surgeon. When we consider that the well being of the patient, and often his life, are jeopardized by the inferiority of instruments, it seems not unreasonable to require of manufacturers a responsibility equal to that of the surgeon who is held morally, often legally, responsible for his patient. One should feel secure to accomplish safely any contemplated surgical procedure. The surgeon of whom so much is demanded is wholly dependent upon the instrument makers for those mechanical appliances and devices which render possible the accomplishment of his purpose as an operator.

Manufacturers who offer surgeons' instruments to be used in conditions where life and future usefulness are at stake should have a conscience not hardened by commercialism. Certainly they are morally responsible with the surgeon if by reason of the failure of their appliances success is not attained. Moreover, there is a certain amount of confidence lacking in the surgeon unless he has a feeling of perfect confidence in his instruments. An accident occurring in the midst of a serious operation is not only embarrassing to the operator but may so affect him as to render him almost unfit to continue the gravely responsible task before him.

In recent years, surgical instruments have not infrequently grown higher in price and, inversely, inferior in quality. For a time the World War took the blame for altered commercial conditions, because of the great demand of the government for vast supplies, inability to produce the materials needed, etc. There is now no reasonable excuse for such a condition except that some manufacturers have grown so calloused, so commercialized, that conscience in the matter has entirely given place to greed for profit. Our domestic resources certainly can supply every material necessary in the manufacture of this class of goods; the different processes through which metals are put to render them fit for use can and should be done in this country. Painstaking craftsmen in the art of instrument making can be secured even more easily now than ever before.

The author has had reason in the past several months to grow almost vehement in his denunciation of certain manufacturers. A few of these experiences, which are of so grave concern to the patient and even more than embarrassing to the surgeon, will be mentioned along with a few explanatory remarks on the accompanying photographic illustrations.

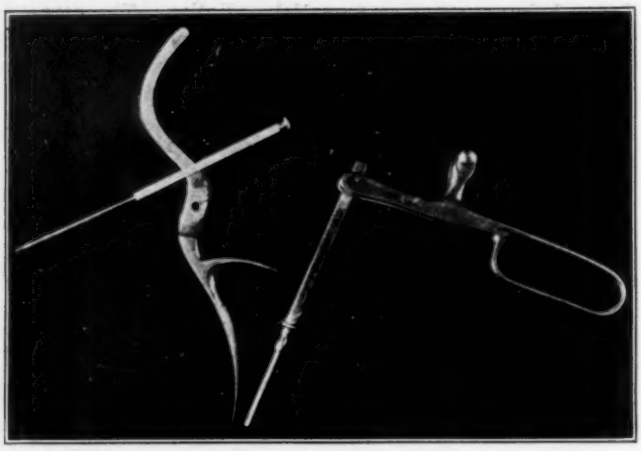


Fig. 1.

In Fig. 1 is shown a tonsil snare that has in many cases proved a delusion as well as a snare. Among its fellows it appears mechanically perfect. Threaded properly, one picks it up with a feeling of confidence that is lost the moment that any force is brought to bear upon it. Either it frequently refuses to produce the desired tension on the loop or the entire instrument on occasion falls down completely, leaving the operator grasping an assortment of parts—and the patient and his friends wondering if their judgment in choice of surgeon has been in error. This particular instrument has repeatedly duplicated this performance to my certain knowledge, but has now been retired from service.

In Fig. 2 (A, B and C) are shown three trephines that were broken in a single operation. In this case the skull was of ordinary density and there was no apparent reason for the failure of these instruments to prove trustworthy. In A (at the left) is shown a trephine that had not seen previous service. It was quite new. Note the turning of the edge, and imagine the surgeon's relief that the old and tested instrument (B) was at hand to depend upon in such an emergency. Unfounded faith and shattered hopes! The "trustworthy" old instrument suffered a broken "bit" and was discarded. Again, another trephine was brought into service and after a few strokes it went out of commission from a broken guard. Only because a fourth instrument was available was it possible to proceed with the operation, and then under an intense mental strain lest another accident might occur.

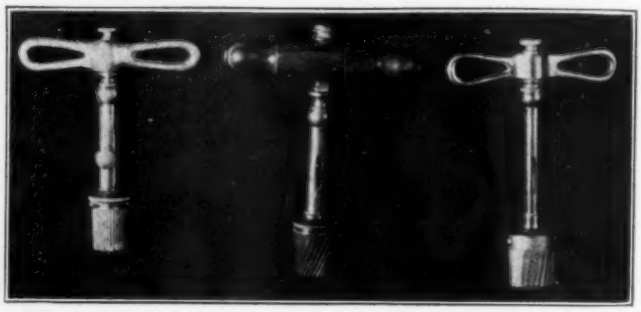


Fig. 2.

Figs. 3, 4 and 5 illustrate a miscellaneous assortment of broken needles, forceps, scalpels, mallet, etc. It is hardly necessary to comment on them other than collectively. They represent what occurs almost daily in the experience of every operator.

In Fig. 6 is shown a roentgenogram of a patient who underwent operation for hypertrophied turbinates. The surgeon in question used a pair of special turbinectomy scissors for the operation. During the course of this procedure the scissors broke. An attempt to remove them followed and failed. A rapidly developing ascending meningitis ensued which caused the death of the patient. There is a question, of course, that had the scissors not broken the patient might have been alive.

Is it not time that we as a profession remonstrated and demanded of manufacturers co-accountability in fur-

nishing us dependable "tools" with which to undertake our grave responsibilities?

## IN DEFENSE OF SURGICAL INSTRUMENTS

*Dr. Thorek's frank criticism of surgical instruments and their present quality was submitted by* THE MODERN HOSPITAL *to one of the leading manufacturers and dealers in surgical instruments in this country, whose comments may be of interest.—Editor.*

"In many respects I agree fully with Dr. Thorek," writes the member of one of the outstanding surgical instrument manufacturing firms in the United States, "but I believe the publication of such an article without further explanation would be misleading to the surgeon and an injustice to the instrument maker who is really making every effort to improve the quality of instruments.

"Dr. Thorek is quite right in his statement that many instruments of inferior grade are being sold. So are poor goods of every description, and while, as Dr. Thorek indicates, the purchase of surgical instruments is a matter of great importance, unfortunately few hospital superintendents or surgeons ever question the *quality*, and buying is done wholly on a *price* basis. Only too frequently are instruments bought at a 'bargain' and from individuals who have no established business but who buy job lots of rejected material which should never be allowed to reach the hands of the surgeon. Who could expect to have reliable instruments which are given away as a premium

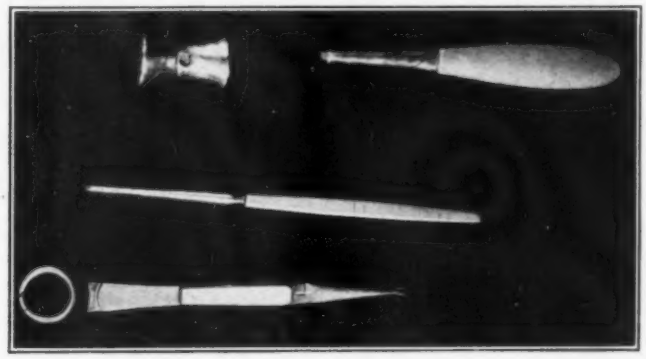


Fig. 3.

with a cross of catgut? Yet this is being done today and many buyers compliment themselves on their 'find.'

"Many instruments of the best quality are ruined by careless handling. Who could expect a delicate pair of forceps to remain in good order when they are dropped on a tile floor, used as needle holders, for clamping rubber tubing, or most anything except for what they are intended? And who hasn't seen a perfectly good pair of surgical scissors used for cutting a piece of steel snare or silver ligature wire?

"The mallet illustrated might have been used for driving spikes, but because it broke, the instrument maker is blamed. Of course I know Dr. Thorek would not do any of these things, but there are many persons around a hospital who make use of tools, and when it comes to variety, surgical instruments offer a wonderful assortment.

"In handling repairs one can well judge what happens. Instruments are received by us broken and bent almost beyond recognition. Much of this damage is done in careless handling in sterilization. Such articles as are commonly known as 'jointed,' forceps, scissors, ronguers, etc., are seldom properly cleaned, dried and oiled after

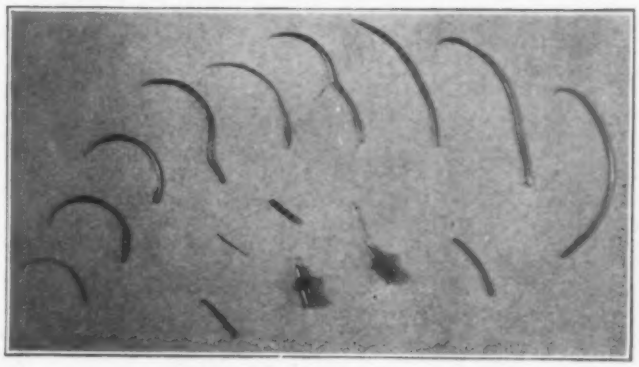


Fig. 4.

operation. The result is an accumulation of rust in concealed parts, and broken screws, loose joints and other weakened parts are the result. For some reason the right care of instruments is a subject which is given little attention by many surgical nurses.

"The illustrations submitted are interesting indeed. Fig. 1 shows a tonsil snare, one which is used probably as much as any tonsil snare on the market. Until recently, when the patent on this particular instrument expired, all this make of snares sold were made by one individual and this man is considered second to none in the making of fine instruments. The chances are that it either was not assembled properly, or repaired by someone who did not know his business.

"Fig. 2 shows some trephines. If a trephine, which must necessarily be thin, is bent sidewise, as this picture shows, one of two things is going to happen: either the metal will split and bend, as this one did, or it will break completely.

"The hæmostats in Figs. 3, 4 and 5 are marked "Japan" and were no doubt purchased during the time when better instruments were not available, but if bought from some responsible house, that house will no doubt replace them. This is equally true of suture needles. The best needles have always come from England, but owing to an embargo on surgical needles during and for a time after the war, none were imported. Many were sold which were of domestic make, both to the Medical Department of the Army and for lay use. It was impossible to produce needles equal to those of English make, as they bent

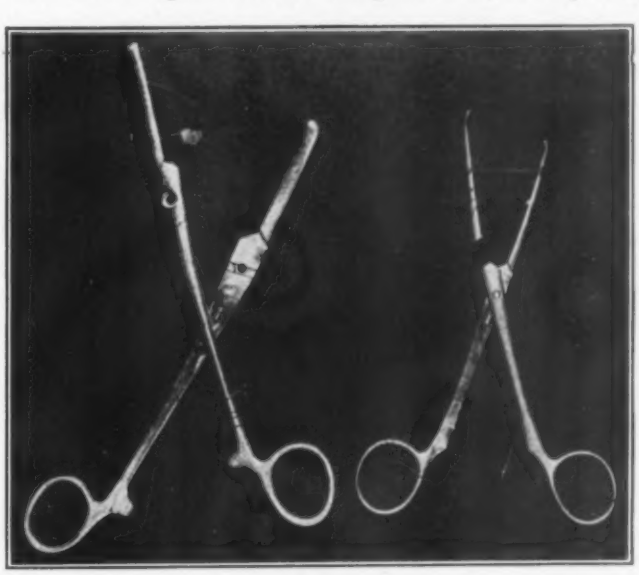


Fig. 5.

Fig. 6.

easily and many were poorly constructed otherwise. Unfortunately, this industry did not develop further and today all surgical needles come from Europe.

"Dr. Thorek's statement that skilled instrument makers are plentiful is an error. There is a smaller number available now than ever, owing to the fact that the surgical instrument industry in this country is not one which attracts mechanics, who must spend some years in apprenticeship.

"Those instruments which we manufacture are of necessity few in variety as compared with the total required. Were it possible to export, we could then manufacture in large enough quantities of each pattern so that greater use of machinery could be made, but at present-day costs few surgeons could pay the necessary price for surgical instruments made by hand, at a cost many times that of an imported article of equal merit."

## A PRACTICAL VENTILATING SYSTEM FOR HOSPITALS

Hospital authorities have become greatly interested in a new device now being marketed, and which offers a simple, yet very practical solution of hospital ventilating problems. The device, which is offered in a number of different forms, consists of an adjustable all-metal ventilator which can be used for windows, transoms or door panels. The ventilator is made in a wide range of sizes and finishes so that it is suitable for almost any requirements.

These ventilator sashes give ample fresh air. They can be adjusted against draughts, yet when desired they may be readily replaced by the customary glass sashes.

The ventilator proper consists of a steel frame containing adjustable louvers which can be completely closed or opened to any degree by means of an adjustable knurl or button in the side of the frame. The louvers are made with flanges which interlock when the ventilating section is closed. This makes the construction absolutely airtight. This unit can be fitted into any window by means of adjustable caps at either end.

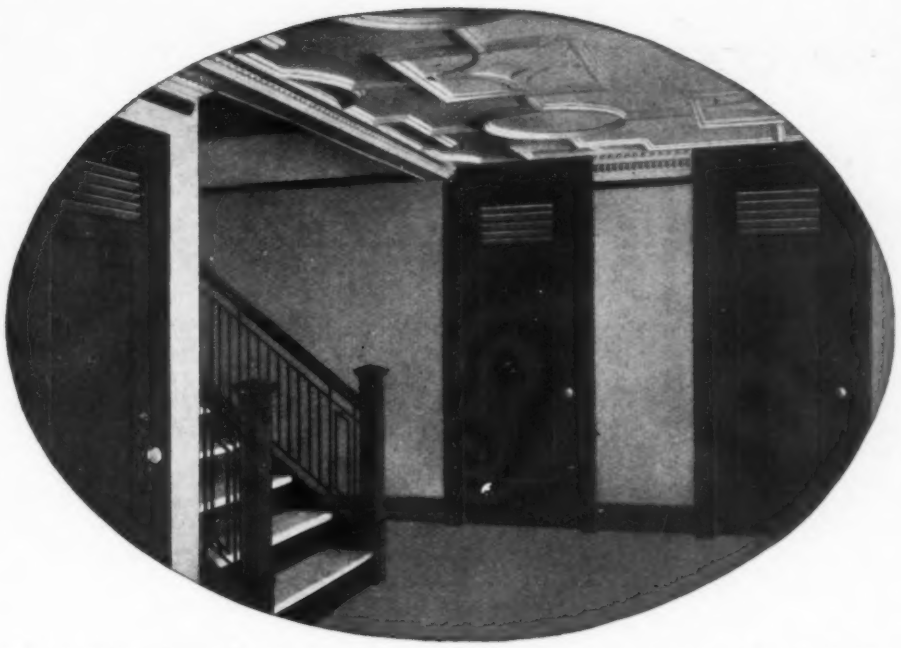
When intended as a window ventilator there is added a wire screen which prevents flies, bugs or other insects from entering. Frequently these ventilators are furnished with wood frames, particularly for transom and window use. The frames are finished with at least three coats of weather resisting paints, which match the finish on the ventilating section. The weatherproof construction of the ventilators permits of their continuous use and yet allows plenty of fresh outdoor air to enter the room at all times.

To complete the process of ventilation, however, an additional system of small adjustable ventilators are suggested for use either in the door transom or in the door panels themselves. Such a system gives a thorough circulation of air through the room or wards, absolutely protecting against draughts and thoroughly adjustable.

For hospital purposes the use of the door ventilators is particularly desirable. When these ventilators are in use the unsightly half length screen frequently used may be discarded. Ample ventilation is secured, yet the privacy of the room is protected against the casual passerby. When the door or transom ventilator is closed, sounds are almost completely excluded.

The use of this device, however, is not limited to mere ventilator sections. Entire windows are constructed in accordance with the same principle and these windows may be mounted and counterbalanced so as to be raised and lowered like an ordinary window. When thus used, the sashes are also frequently supplied with wire screening, thus combining the features of a window screen as well. The use of such windows in hospitals is at once apparent as with a device of this kind any variation of light and air, as well as protection from the elements, is easily obtained. Both the upper and lower sashes are of the usual shape and may be mounted in conjunction with the ordinary glass window; or they can be used to replace one or both of them.

The manufacturer now supplies a complete window unit for buildings. This consists of the exterior screen, two glass window sashes and two ventilating



The ventilating transom in the upper panels of these doors solves a vexing problem of hospital ventilation.

sashes, all mounted in a special frame with customary weights so that any combination desired may be secured. This unit is so designed that either the window or the ventilator sashes may be dropped below the level of the window sill into a pocket. When the sashes are all in the sill pockets, a suitable cover closes the pocket to keep out dust and moisture.

With this construction it is possible to have any number of combinations. With both the glass and ventilator sashes lowered the entire window space is opened, or if greater privacy is desired, the ventilator sashes are raised in place, permitting free ingress of air but greatly reducing the light.

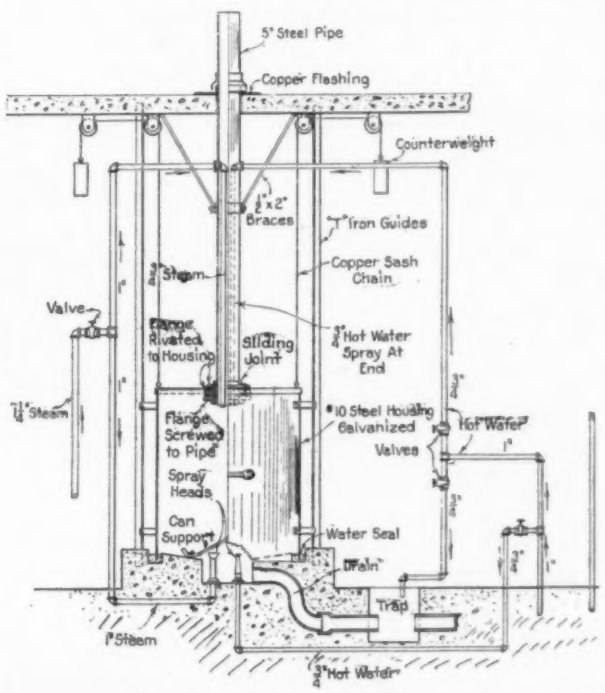
The fact that the louvers or slats in the ventilator sashes are completely adjustable enables this device to be used either as a ventilator or a shutter or both.

In the construction of sleeping porches or solariums, the separate window units can be joined edge to edge so as to make a continuous wall composed entirely of windows.

The value of this device for hospital construction is readily apparent. It offers a quickly transformable window which will admit sunlight and air in the exact degree desired, being equally adaptable for either winter or summer use.

## GARBAGE CAN STERILIZER

Among devices that help to maintain the high standard of sanitation at the Edward Hines, Jr., Hospital at Broadview, Cook County, Ill., is a cleverly designed garbage can sterilizer. This device was originated by the plumbing contractor and suggests utilization of similar apparatus in other hospitals. The method of sterilization, as originally planned, is working out satisfactorily at the government hospital, it is understood.




Courtesy, Domestic Engineering.

The detailed drawing shown herewith explains the method of sterilization employed. Cans are placed upside down on the supporting rack, the outer cover pulled down over them, and steam and hot water sprayed from both top and bottom, so as to thoroughly clean the cans. All of the apparatus shown is in a fixed position except the bell-shaped cover that slides upon the stationary five-inch vent column, which also serves to house the upper steam and water pipes. A drain, four inches in size, serves the apparatus and discharges through a trap, as is shown, to the sanitary sewer.

The Edward Hines, Jr., Hospital is probably better known as the Speedway Hospital, which was recently opened by the United States Public Health Service.

## TO CHANGE A. H. A. ELECTION PROCEDURE

Trustees of the American Hospital Association have appointed a committee to develop a new election policy which will be put into effect at the 1922 convention in Atlantic City. Criticism has been made, it is said, that association elections in the past were not sufficiently dignified and deliberative. With the appointment of the nominating committee a full year in advance, as was done at the last meeting, the trustees believe such objections will be overcome. Changes contemplated include the report of the nominating committee early in the week, other nominations from the floor, issuance of blank official ballots as each active member or voting delegate registers, and voting by written ballot.

Miss E. M. Geraghty, secretary of the American Dietetic Association, formerly of Champaign, Ill., is now at Lakeside Hospital, Cleveland.

# MEETINGS, CONVENTIONS AND CONFERENCES

## METHODIST HOSPITAL WORKERS DISCUSS MUTUAL PROBLEMS IN FOURTH ANNUAL CONFERENCE

REPRESENTATIVES of sixty hospitals, homes for the aged, and orphans' homes of the Methodist Episcopal Church of America were present at the fourth annual conference of the Methodist Hospitals and Homes Association held in Chicago on February 15-16. Association officials consider the convention, because of its profitable papers and discussions, the most successful in the brief history of the organization.

E. S. Gilmore, superintendent of Wesley Memorial Hospital in Chicago, was re-elected president of the association at the business session which concluded the two-day program. S. W. Robinson, superintendent of the Methodist Home for Children of Buffalo, N. Y., was named first vice-president; J. A. Diekmann, superintendent of Bethesda Hospital of Cincinnati, second vice-president; Miss Blanche M. Fuller, superintendent of Nebraska Methodist Hospital of Omaha, third vice-president and chairman of the nurses' training committee; the Rev. W. H. Underwood, superintendent of the Crowell Memorial Home of Blair, Nebr., fourth vice-president and chairman of the committee on homes for the aged and children; Mrs. W. A. Phillips, superintendent of the Methodist Home for the Aged of Chicago, treasurer; W. H. Jordan, superintendent of Asbury Hospital of Minneapolis, was re-elected secretary.

Highlights in the 1922 program were Mr. Gilmore's instructive paper on "Personal Relations of Hospitals to Patients"; the address of Dr. Willard C. Stoner, director of medicine at St. Luke's Hospital at Cleveland, on "The Hospital Problem in Relation to Modern Medicine"; and a half-hour's instruction in publicity methods by Dr. Ralph W. Keeler, director of publicity for the Methodist Church, with headquarters at the Methodist Book Concern in Chicago.

### Nurses' Helpers Form Storm Center

Dr. C. S. Woods' paper on nursing problems, and Rev. C. M. McConnell's talk on rural health, were provocative of the most lively discussion of the convention. Dr. Woods' advocacy of the nurses' helper brought forth a storm of opposition, and the Rev. Mr. McConnell's picture of deplorable medical service in country communities did not pass unchallenged.

In his address on personal relationships between hospitals and patients, Mr. Gilmore, speaking at the closing afternoon session, said in part:

"The properly managed hospital will see that an entering patient gets immediate attention. He will be made welcome, and impressed with the fact that his interests are to be uppermost in the thoughts of everyone in the hospital, that his welfare is to be the hospital's first consideration. The necessary office record and financial arrangements should be made promptly and as pleasantly as possible. He should then be escorted to his room, preferably by a nurse. The head nurse of the floor should make it her duty to call upon him immediately to answer any questions he may wish to ask and to see that his room is in proper condition. An intern should wait upon him at the earliest possible moment, that the patient may know his physical condition is under early consideration. A hospital should be provided with a recreation or living room where patients may go and converse with one another to get away from their beds and forget their troubles temporarily. Hospitals in large cities or hospitals located where restaurant facilities are not convenient can well afford to have a small dining room for the use of the friends of patients who may be present during meal hours. This dining room probably will not pay expenses except in an indirect way. No one can compute the value to a hospital of the good will of the patients and their friends. Anything which will make for the increasing of this good will should be adopted.

"The attitude of the interns, nurses, and employes in the hospital will determine in very large measure the reputation of the hospital. People who are sick physically are usually sick mentally. They may be more grouchy, more unreasonable, and more demanding than when well, or they may be more susceptible to sympathy, more desirous of winning the esteem of those about them. In the former case the hospital must disarm suspicion, must overcome prejudice, must win the patient in spite of himself. In the latter case the hospital has an opportunity for doing good that is rarely equaled in any other walk in life. It should be the constant desire of everyone in the hospital so to conduct himself that when the patient leaves he will gladly say it was good to be there. The hospital management should always keep this in mind and both by example and precept impress everyone in the hospital with the thought that each patient is the guest of the individual nurse, intern, or employe. If each person in the hospital fully realizes that he is the host to the patient and that he should treat the patient as he would a guest in his own home, the hospital has gone a long way towards making the patient happy and increasing its own popularity.

"No hospital management has a right, however, to ex-

pect that his condition will exist automatically in the minds and hearts of the hospital personnel. It is the business of the management to implant it by seeing that the conditions in the hospital are such as to make the helpers part of the institution and desirous of doing all they possibly can do to assist the patients. This means the best possible accommodation for nurses, interns and help. The time once was that the nurses were domiciled in some nearby dwelling house that had been converted into a nurses' home by the simple expedient of setting aside the parlor as a reception room and then crowding the nurses into every other room in the house, including the kitchen and pantry. Employes were usually housed in the cellar and attic of the hospital, generally called basement and top floor to salve the conscience. The interns were crowded into just as few rooms as possible and were generally impressed with the idea that they were not physicians and men but incorrigible boys, who could always be expected to do the wrong thing at the right time. All these people, interns, nurses, and employes, are entitled to the best living conditions the hospital can afford. You may be sure the patients will receive exactly the same kind of treatment that the hospitals give to those who care for the patients."

### Says State Medicine Threatens

Dr. Willard C. Stoner of St. Luke's Hospital in Cleveland brought the viewpoint of the medical man before the convention.

"If we are to prevent state medicine, where medical men become mere hirelings and the standard of practice becomes consequently lowered, there must be greater cooperation between hospital boards of trustees and the medical staff," declared Dr. Stoner.

"The hospital must sell medicine. It must realize on medical practice. There must be some basis of equity. The day is almost done when one group in the hospital shall have handsome incomes and other departments show a deficit. The medical man must be careful lest the legislature step in and in an attempt to remedy such conditions make him the employe of the state."

According to Dr. Stoner, the hospital should be a complete workshop where not only scientific treatment is given but where all cases difficult of diagnosis can go at a cost which is not prohibitive and where all worthy practitioners of medicine may take their cases for diagnosis and for suggestions as to proper therapy.

### Cooperative Clinics Compete with Doctor

Many cooperative clinics, Dr. Stoner declared in his address, are competing with the whole profession by taking cases not only for diagnosis but for treatment. This practice, he says, will tend to lower the standard of medicine since it will take from the worthy man in general practice his best clientage and will not afford him hospital facilites.

"Hospital practice is the greatest incentive to do good work. Standardization of hospital practice, such as is being done by the American College of Surgeons, is tending to elevate the standard of medicine generally. Fads, quackery and sectarianism will thrive less when the public generally is educated as to the value and limitations of modern medicine. The facts of modern medicine rationally applied will bring a proper respect for medicine, greatly alleviate human suffering, prevent disease and eliminate a great waste. The hospital must ever be the important means of making these facts accessible to the public.

"The establishment of hospital facilities in rural communities must be the rational solution of medical practice in these districts. The investment in the modern training of medicine is too great to make rural practice inviting today. Better conditions must be the solution. Good roads and our present means of transportation make the establishment of hospitals in the larger town in rural communities practical. It will be less and less necessary for the acutely ill to be taken to the larger centers for diagnosis and treatment, which is often at the expense of the well being of the patient."

### Conducts Class in Publicity Methods

Tips for hospital executives in publishing their annual reports were given by Dr. Ralph Welles Keeler in an informal and amusing address, lightened and made specific by classic examples from the reports of the very hospitals represented at the convention. His remarks had chiefly to do with the psychology of type and illustration.

Warnings against the interment of hospital needs in agate among broad columns of uninteresting data, against columns of meaningless figures, against imperfectly focused, inverted and distasteful halftones were sounded by the publicity head of the church. Concrete facts, he declared, should make up the annual report, such as the information, printed and pictorial, that the hospital has during the year consumed 220 Texas steers, has in a week filled with sheets a clothes line seven miles long and similar facts.

Mr. L. O. Jones struck the same note in his address on "The American White Cross" at a previous session. The American White Cross is a Methodist organization for providing for the sick and homeless; funds for the work are gathered through annual membership campaigns, similar to those of the American Red Cross. It is now organized in thirty-eight Methodist conferences and is supplying large sums for the support of hospitals and homes.

"Hospitals have not produced much attractive publicity," said Mr. Jones on speaking of the value of advertising publicity in the White Cross movement. "It has been too cheap, cheap paper, cheap printing, cheap effect. The hospital must learn to make a bid for support in the right way. Copy must be carefully prepared, it must touch a responsive chord in its readers and it must be presented in a form attractive to the eye."

### Rural Conditions Call for Heroism

Problems of rural health were touched upon in a lively address by the Rev. C. M. McConnell, representative of the Methodist Board of Home Missions. The city with its slums produces healthier children than the country, he asserted, quoting statistics gathered during a four-year period in New York state which showed that eighty-seven per cent of the rural school children as compared with seventy per cent of the city school pupils had health defects.

"Improvement of human health and welfare is a problem of national significance," declared the Rev. Mr. McConnell. "It is a moral problem and heroic steps must be taken to meet it. In twenty counties of New York state, all rural, the number of doctors decreased twelve per cent from 1911 to 1920. Ninety-seven per cent of the doctors in these districts have been in practice for more than twenty-five years. Ninety per cent of rural people have never seen the interior of a hospital.

"The church should train medical missionaries to go out into the country and build up the health of the people. Graduates of medical colleges should be persuaded to undertake such service. It takes as much heroism to practice medicine in a country community as to fight for sanitation and better health measures in Korea. Local out-

posts for emergency treatment should be established in rural centers."

That the traveling clinic might solve the problem of rural health was suggested in the open discussion which followed. President E. S. Gilmore suggested that the home missionary board of the church might be interested in the problem of rural medical workers as the foreign mission board supplies workers for the foreign field.

### Urges Employment of Nurses' Helpers

A plea for nurses' helpers was voiced by Dr. C. S. Woods, superintendent of the Methodist Episcopal Hospital at Indianapolis, in his discussion of "A Phase of the Nursing Problem."

The student nurse, in his opinion, should not be required to do commonplace tasks which must be repeated ad infinitum. To require a student to make beds hundreds of times and to carry thousands of trays is not his idea of good teaching. If a school child were asked to repeat the multiplication table every day during an entire school year, Dr. Woods argues, it would follow that he was either a dunce or his teacher was crazy.

"Women who are ambitious and sufficiently prepared to essay the curriculum of good nursing schools will not give a large amount of time and energy to a daily round of ordinary and even menial tasks," Dr. Woods declared in his address. "They seek an education. It is not an exaggeration to say that they are getting it in only a few institutions."

Dr. Dickmann, superintendent of Bethesda Hospital at Cincinnati, took issue with Dr. Woods on the subject of nurses' helpers.

"Where will you get them?" he challenged. "You can hardly obtain maids for the kitchen. These nurses' maids must be women of fine qualities of the same timber as student nurses. Where will you find them?"

Dr. Stoner and others thought the danger of their competition with graduate nurses would be real. Matrons of homes declared they believe it the hospital's responsibility to regulate the social life of these women and this would constitute an added burden.

Christian hospitals should measure up to secular institutions "and then some" in the opinion of Dr. W. H. Jordan of Asbury Hospital, Minneapolis, in leading a round table discussion on "Progress and Standardization." Only thirteen Methodist hospitals of 100 beds and over have been recognized on the approved list of the American College of Surgeons, he declared, but many more would overcome slight handicaps which barred their recognition before another year. Insufficient financial support to enable the institutions to provide x-ray and other laboratory equipment and to install a system of case records is responsible for many failures to obtain approval.

Dr. N. E. Davis discussed organization and hospital administration with particular relation to the church in a brief address. Dr. William J. Davidson, executive secretary of the commission of life service, addressed the convention on "Life Service and Nurse Training."

On Wednesday evening following a social hour and special music by the nurses' chorus from Wesley Memorial Hospital, Dr. W. A. Robinson, superintendent of Christ Hospital, Cincinnati, spoke on "The Devil and the Benevolence," a discussion of hospital financial problems as related to the church. Stereopticon slides of hospital and homes under the jurisdiction of the denomination were shown by Dr. Davis. Other addresses had to do purely with the question of homes for the aged and for children.

Matthew O. Foley, executive secretary of the National Hospital Day committee, brought before the convention plans for the 1922 observance of the day and a resolution was passed reaffirming the association's previous endorsement of the movement.

## CONFERENCE ON EDUCATION, LICENSURE, PUBLIC HEALTH AND HOSPITALS

The annual Congress on Medical Education, Licensure, Public Health and Hospitals will be held in Chicago March 6 to 10, at which meeting will be presented the American Conference on Hospital Service, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges, the Council on Medical Education and Hospitals and the Council on Health and Public Instruction of the American Medical Association.

On Friday, March 10, is the session on the hospital and dispensary conducted by the American Conference on Hospital Service. The complete program for the day's session follows:

Address of chairman, Dr. Frank Billings, president of the American Conference on Hospital Service.

"The Fundamental Principles of the Standardization of Hospitals," John G. Bowman, chancellor of the University of Pittsburgh.

"Qualifications and Training of Hospital Superintendents," Dr. Arthur C. Bachmeyer, superintendent of the Cincinnati General Hospital.

"Hospital Library and Service Bureau," Dr. Malcolm T. MacEachern, general superintendent of the Vancouver General Hospital, Vancouver, B. C.

"The Dispensary as a Factor in Medical Education and as a Diagnostic Clinic," by Dr. William S. Thayer of Baltimore.

"The Dispensary in Its Relationship to the Public and to the Medical Profession of the Community," Michael M. Davis, Jr., chief of Service Bureau on Dispensaries and the Community Relations of Hospitals of the American Hospital Association, New York.

"The Relationship of the Dispensary to the Hospital," by John E. Ransom, superintendent of Michael Reese Dispensary, Chicago.

The opening day's program will be in charge of the Council on Medical Education and Hospitals and will have to do with public health and educational problems. On March 7 there will be an address by Dr. Theodore Hough, president of the Association of American Medical Colleges, and reports from various schools and colleges of medicine in the Middle West. The program on March 8 will be devoted to the subject of medical examinations and licensure. Thursday's program, March 9, will be on the general topic of the organization of the public for cooperation with the medical profession.

## VERMONT IS NEWLY ORGANIZED

Organization of the Vermont Hospital Association took place on December 3 at a meeting at Burlington. The following officers were named: Benjamin Williams of Proctor, president; Dr. T. S. Brown of Mary Fletcher Hospital at Burlington, vice-president; John P. Adams of St. Albans, secretary; and Miss Mary Carr Newell of Rutland Hospital at Rutland, treasurer. The executive committee is composed of the officers and the following: Sister Mary Collins, superintendent of Fanny Allen Hospital at Winsooki; Rev. Mr. Fraser Metzger of Randolph; and Dr. T. A. McCormick, superintendent of St. Albans Hospital at St. Albans.

The next meeting is to be held in September at a place not yet named.

DEPRESSION follows stimulation, as surely as night follows day. The pendulum always swings back in the opposite direction.

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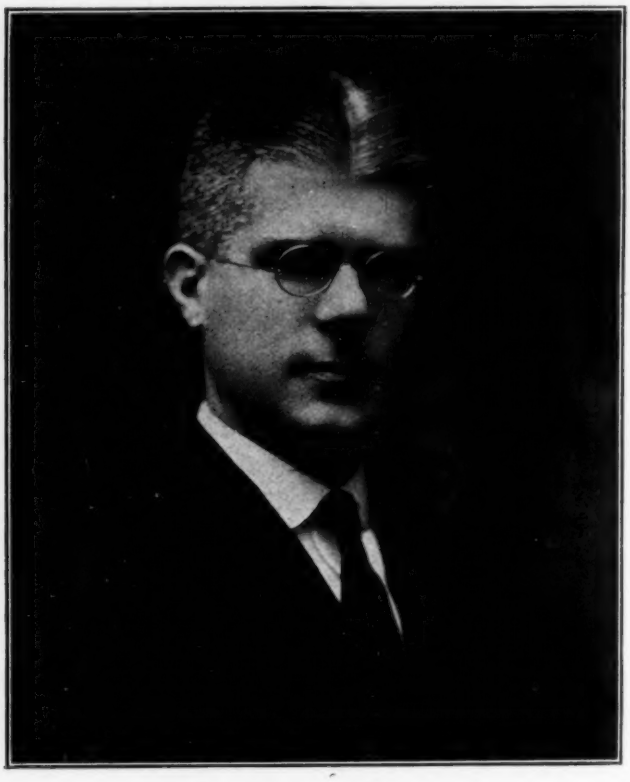
## MISSOURI HOSPITAL ASSOCIATION IS PERMANENTLY ORGANIZED

More than fifty hospital superintendents, trustees, members of staffs and others interested in hospital work attended the St. Louis meeting on February 17 at which the Missouri Hospital Association was organized. At an evening meeting at Hotel Statler a constitution and by-laws were adopted, officers chosen and a motion passed to seek affiliation with the American Hospital Association.

Dr. L. H. Burlingham, superintendent of Barnes Hospital and St. Louis administrator of St. Louis Children's Hospital, was elected president of the new organization.

Other officers include the following: First vice-president, Dr. B. A. Wilkes, superintendent of Missouri Baptist Sanitarium, St. Louis; second vice-president, Miss Sarah H. Reitz, superintendent, Audrian Hospital, Mexico; treasurer, Dr. Louise Ament, superintendent, Lutheran Hospital, St. Louis; trustee for one year, Dr. Rush E. Castelaw, superintendent, Christian Church Hospital, Kansas City; trustees for two years, Miss Isabelle Baumhoff, superintendent, St. Louis Maternity Hospital, and Dr. Guy L. Noyes, superintendent of Parker Memorial Hospital, Columbia; trustees for three years, Miss Mary G. Burman, superintendent of Children's Mercy Hospital, Kansas City, and Dr. M. O. Biggs, superintendent of State Hospital No. 1, Fulton.



DR. L. H. BURLINGHAM
President, Missouri Hospital Association.

A local committee, headed by Dr. Rolla Henry, furnished all delegates with transportation to such hospitals in St. Louis as they desired to visit. For those who wished to study some particular feature of hospital work, suggestions were given by the committee as to where such features were best demonstrated and a route was mapped out which included them. The entire morning was given over to getting acquainted and to visiting hospitals.

Luncheon for all those in attendance was given at the St. Louis City Hospital at 1 o'clock, following which a tour of the hospital was made.

Dr. A. R. Warner, executive secretary of the American Hospital Association, was the speaker at the evening session, which followed a dinner at Hotel Statler. The business session concluded the day's events.

## NORTH CAROLINA HOSPITAL WORKERS HAVE LIVE ANNUAL MEETING

North Carolina held the most enthusiastic hospital association meeting in its history on January 31 at High Point, it is said. More than 100 hospital administrators of the state were present when Dr. H. B. Hiatt, chairman of the committee on arrangements, called the meeting to order in the assembly room of the Sheraton Hotel.

Mayor John W. Hendrick of High Point delivered the address of welcome to the convention on behalf of the city and Dr. John A. Williams of Greensboro extended welcome to the assembly on behalf of the Guilford County Medical Society. Response to the addresses was made by Dr. James M. Parrott of Kingston, member of the executive committee.

Dr. John T. Burrus' presidential address on "Our Duty to the Sick" was interestingly given and well received. The principal address on the evening program was given by Dr. Howard A. Kelly of Baltimore on his experiences in handling "The Cancer Problem." His remarks brought much applause. Round table discussions of the afternoon concerned problems of the hospital and nurses' training school. Several commercial exhibits were on display.

Officers of the association chosen at the meeting include: Dr. J. A. Williams of Greensboro, president; Dr. James R. Alexander of Charlotte, secretary-treasurer. Dr. Alexander succeeds Dr. John Q. Myers, who has served since the organization of the association.

The next meeting of the association will be held at Wilson, the date to be fixed by the board of trustees, which consists of the following members: Dr. J. M. Parrott of Kingston, Dr. L. B. McBrayer of Sanatorium, Dr. J. W. Long of Greensboro, and Dr. John Q. Myers of Charlotte.

## CATHOLIC HOSPITAL ASSOCIATION TO MEET AT CAPITAL

Washington, D. C., has been chosen as the meeting place of the 1922 convention of the Catholic Hospital Association of the United States and Canada, the sessions to be held at the Catholic University on June 20, 21, 22 and 23.

Accommodations at the Catholic University are excellent for the work of the convention, says Dr. B. F. McGrath, secretary-treasurer of the association, for the housing of the sisters and clergy and for commercial exhibits. Details in regard to registration will be worked out soon.

The 1922 program aims particularly at practical things. There will be fewer general meetings and more emphasis will be placed upon department conferences, it is said. Clinics will be held for physicians and surgeons.

Firms who plan to have exhibits at the convention are being asked to communicate directly with Dr. John M. Cooper at the Catholic University. Other information regarding the convention can be obtained from Dr. McGrath, secretary-treasurer, at 1212 Majestic Building, Milwaukee, Wis.

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# DISPENSARIES AND OUT-PATIENT DEPARTMENTS

*Conducted by* MICHAEL M. DAVIS, JR., Ph.D., Executive Secretary Committee on Dispensary Development, United Hospital Fund of New York, and Chief, Service Bureau on Dispensaries and Community Relations of Hospitals, American Hospital Association, 15 W. 43rd Street, New York
*and by* ALEC N. THOMSON, M.D., Director of Medical Activities, American Social Hygiene Association, 370 Seventh Avenue, New York

## PAY CLINICS FOR VENEREAL DISEASE*

BY ALEC N. THOMSON, M.D., DIRECTOR OF MEDICAL ACTIVITIES, AMERICAN SOCIAL HYGIENE ASSOCIATION, NEW YORK

THE prevalence of venereal disease, while an unknown quantity, is sufficiently great to warrant consideration as a special problem in that general field of public health which is usually understood as including all communicable diseases. Gonorrhea and syphilis are serious diseases that call not only for a certain degree of specialized knowledge, ability and equipment for treatment and diagnosis, but also for an understanding of their public health and social aspects. Because of the necessity for frequent return visits in the procedure of diagnosis and treatment of these diseases and because of the long period of time required to approximate a cure, the problem becomes complicated from a social, public health, and economic point of view.

The development of the pay clinic for patients suffering from venereal disease is a natural reaction against the various factors that have combined to hamper the health officer in his campaign against this special menace and to handicap the infected individual who is unable to meet the average fee of the well qualified practitioner for the necessary long-continued course of treatment and observation. Frequently in the past the patient of average financial resource was not admitted to ordinary dispensary treatment. Under present methods of investigation the restrictions have been made more flexible because of the present-day appreciation of such factors as long-continued and costly treatment. Perhaps more frequently today, the patient, though entitled to dispensary treatment under the present rules of admission, does not desire to avail himself of mere charity, as he interprets it. Whatever the sum total of the considerations may have been, the fact remains that pay clinics for the treatment of gonorrhea and syphilis have been established in various places. Measured in terms of public health, in terms of better service to the infected individual, in terms of reasonable compensation to the physician, in terms of reducing the cost to the patient, these clinics have proved successful.

These pay clinics are of various types; are held at various hours; charge various fees; and serve various groups in the community. The theory upon which the pay clinic seems to be based is that of bringing the best specialized medical service within the reach of the average individual. This plan seems to be easily workable for such branches as the specialties of nose, throat, eye, and the like, in which costs for minor surgical procedures are relatively high, and the period of care and observation of the patient is short. In the special field of gonorrhea and syphilis, however, the problem is more complex and the need for low cost and high grade service is even greater. Treatment is over a long period, and both drugs and equipment are expensive. Laboratory tests for diagnosis, control of treatment, and determination of cure are numerous and somewhat expensive. Time lost from work because of pain, mental distress, physical disability, attendance for treatment, as well as the readjustment of the individual to the community from the point of view of public health and social welfare, are factors difficult to measure but extremely important to consider. There is an endless number of elements that enter into the problem. The solution that we seek seems to lie in the application to the art and science of medicine those common sense measures that have proved efficient in other fields of endeavor —organization and economy. Can adequate special treatment be administered by physicians of ability to large numbers of persons through organized effort at a decided reduction of costs to the patient, coupled with proper remuneration for the doctor? If so, can it be done as far as venereal diseases are concerned without any dislocation of the usual relation between patient and medical adviser? It seems reasonable to assume that, with proper personnel, ethical publicity, social viewpoint, public health ideas, and modern professional procedure, the dispensary can maintain, as a self-sustaining unit of a community institution, a clinic for the treatment of gonorrhea and syphilis in order to provide a service for individuals who receive inadequate care or no care because of a financial and social status that places them in the "no treatment land" between the usual dispensary clinic and the private specialist.

The private practitioner sometimes looks upon and criticizes the dispensary as a competitor. If he does, it is to be expected that he will more frequently feel and more forcibly state that the pay clinic is a competitor. Generally speaking, investigation discloses that there are admitted to venereal disease clinics not over two per cent of patients who could afford to pay for private service of the same standard. The figures of the general dispensary of the University of Minnesota for the month of October, 1920, showed that seven and one-half per cent of the applicants were refused admittance because they did not come properly within the class of dispensary patients. If this is true, it is reasonable to assume that the seven per cent came within the classification that might be admitted to a pay clinic, and that some of the patients

*Read as a part of a Symposium on Pay Clinics before the Section on Medicine of the New York Academy of Medicine, October 18, 1921.

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within the classification entitled to admission to the free clinic were really able to pay something for the service they received, though not the equivalent of the average physician's fee. When it is realized that in New York City a year of treatment, which the syphilographer regards as adequate, costs the patient between $300 and $400, it can readily be seen that there must be a large group of infected individuals unable to finance this period of intensive treatment, to say nothing of three or four additional years of treatment and observation. The pay clinic that can take care of the patient for $75, $100, or $125 renders, therefore, a distinct service to the community, to the patient, and to the physician.

Obviously, the physician in a pay clinic should be compensated. The physician must consider his compensation in three ways: first, in the experience which he constantly receives; next, in the prestige which he derives from his connection and from the large volume of work; and, finally, in the financial reward, which alone is not entirely commensurate with his work. On the other hand, we find that the average physician who is paid for his clinical work receives approximately $5 an hour, which, on the basis of full time, figures to a rate of compensation equivalent to a net income of $10,000 a year. This is based on a six and one-half hour day, six days a week. It is a net income greater than the average medical man's gross receipts, or even his grand total with uncollectable bills included. In other words, he can well afford to devote some hours a week to pay clinic work, upon a purely selfish basis.

### First Pay Clinic in Boston

In 1914 the Boston Dispensary established the first pay clinic for venereal disease. Its experience has shown that there has been no abuse of the dispensary facilities; that there has been no very serious complaint on the part of the medical profession; that more patients with venereal disease are being treated by the private practitioner in Boston today than ever before; and that the clinic has provided a much needed facility. The clinic has grown from 5,380 visits in 1914 to 27,109 visits in 1920. These figures include men, women, and children.

In 1915 the second pay clinic for venereal disease was started at the Brooklyn Hospital. The clinic has had a less dramatic growth than the Boston Dispensary, but has also rendered a distinct service to the community and to the physician. The opposition to this clinic in the early stages was not appreciable, although there were undoubtedly criticism and complaint before the profession thoroughly understood the service that such a clinic can render. As the clinic grew and its work became understood, a considerable percentage of patients was referred to the clinic by the physicians to whom they came, indicating that the medical profession needs such a service as that of the pay clinic.

Following the opening of venereal disease pay clinics in the Boston and Brooklyn dispensaries, additional pay clinics were established elsewhere, among the early ones being two pay clinics in Cleveland. The medical profession of Cleveland, upon receiving complaint that these clinics were trespassing upon the territory of the private practitioner, officially studied and investigated the situation; and, while in their general report there was some criticism of one hospital's methods, there was no refutation of the soundness of the philosophy of pay clinics in general, nor was there any criticism of the policy and methods of the other hospital.

In Chicago an organization that is campaigning against venereal diseases maintains a pay clinic for venereal diseases that is not affiliated with any hospital or general dispensary. It is questionable whether or not the best service can be rendered by an isolated clinic. The clinic that is part of a general dispensary has untold advantages of consultation, of common use of laboratory, nursing and social services, of general administration, and the like, which should result in a reduction of costs and in greater efficiency. This clinic, however, has been very successful. It is meeting an apparent need of the community. It is self-sustaining. There has been marked disapproval of this clinic by the medical profession, but this disapproval does not appear to be based entirely upon sound reasoning and appears to be, in part at least, aggravated by personal considerations and elements of jealousy.

There is also another type of pay clinic in Chicago—an interesting experiment under private auspices, which is advertising to the public in the daily press. This type of clinic for the treatment of venereal disease is open to many serious objections and criticisms. It is difficult to keep out the elements of quackery. The clinic was founded and is backed by men of wealth, upon the principle that everyone and anyone is entitled to relatively standard service at a standard price. If you buy a pair of shoes worth $5 at retail for $5, you are being dealt with fairly. If, in the same environment with the same service, you pay $7 or $10 for a $5 pair of shoes, you are being "done." If, on the other hand, you choose to buy a $5 pair of shoes surrounded by luxury, much personal care, attention, and service, then you have to expect to pay for this high overhead and to pay $10 for a $5 pair of shoes. The theory is intriguing but difficult to apply to the ordinary medical problems. Nevertheless, this clinic has grown until now it is said to be treating from 300 to 600 patients a day at an average fee of $1 or $1.50 for gonorrhea or syphilis. This clinic, too, has been investigated by the medical profession and criticized in its weak spots. Its principles, however, are of such importance as to warrant greater consideration than has heretofore been given to the subject.

Group medicine frequently resolves itself, in the final analysis, into the private pay clinic. In Rochester, Minn., it is possible to receive a six weeks' course of intensive treatment for syphilis at a total charge, including transportation and hotel bills, which approximate the average fee in New York City for the same period of time. In many places the difficulties surrounding the provision of treatment for those suffering from gonorrhea or syphilis are so pressing that great thought is being given to the problem of the provision of adequate treatment and diagnostic facilities at a reasonable cost. Up to the present moment nothing better has been offered than the pay clinic, either private or public. The individual practitioner of medicine cannot economically administer a dose of salvarsan for $5. The pay clinic, organized on the basis of making no profit, can administer salvarsan for $5 and compensate the administrator. The business principle of reducing cost as the volume of production increases applies, with certain modifications, to medical practice. It is our opinion that the pay clinic for the treatment of gonorrhea and syphilis has come to stay, whether the medical profession likes it or not. It is our further opinion that the dispensary must recognize its limitation in this field, and that the profession must recognize its obligation. This obligation calls for the staffing of the dispensary pay clinics and the establishing of private pay clinics for the purpose of combating the venereal diseases—one of the greatest public health menaces and economic liabilities.

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# OCCUPATIONAL THERAPY AND REHABILITATION

*Conducted by* HERBERT J. HALL, M.D., President, American Occupational Therapy Association, Devereux Mansion, Marblehead, Mass., and MRS. CARL HENRY DAVIS, Advisor in Occupational Therapy, 825 Lake Drive, Milwaukee, Wis.
*Co-Editors:* LORING T. SWAIM, M.D., 372 Marlboro St., Boston Mass., and MISS MARY E. P. LOWNEY, Room 272, State House, Boston, Mass.

# ACCOMMODATION FOR OCCUPATIONAL THERAPY IN FEDERAL TUBERCULOSIS SANATORIUMS

BY THOMAS B. KIDNER, INSTITUTIONAL SECRETARY, NATIONAL TUBERCULOSIS ASSOCIATION, NEW YORK

IN ITS study of the requirements for sanatoriums for the care and treatment of ex-service men, the United States Public Health Service arrived at certain standards and prepared type plans for housing the patients. Because, however, of the widely varying conditions of hospital sites (not to be foreseen) it was decided that, as regards accommodation for occupational therapy and pre-vocational training, it was not feasible to try to prepare standard plans. It was felt that it would be better to place in the hands of architects a statement or specification of the standard requirements, each architect being then free to fit into his building scheme the necessary accommodation.

In the units for tuberculous patients now being erected at several of the branches of the National Soldiers' Homes, the architects have taken advantage of the contours of the site and have provided both for recreation and occupational therapy in the lowest stories of the patients' units. This has also been done in the remodeling of the Soldiers' Home at Johnson City, Tenn., which is now the National Sanatorium. In no case can the rooms provided be termed "basements," as they are almost wholly, sometimes entirely, out of the ground, well lighted and airy.

## Needs of Tuberculous Patients

The following statement of requirements is taken from United States Public Health Service Report No. 24, June 17, 1921:

"While much of the work of occupational and pre-vocational therapy is carried on in a sanatorium in the wards and on the porches, especially in the semiambulant patients' quarters, it is necessary to provide a center for this work to which an ambulant patient may go when his condition permits, and from which the work may be directed.

"In small institutions, the occupation therapy center or 'vocational building' (as it is sometimes termed) is usually combined with the community building, but in large institutions a separate unit is usually arranged.

"In considering what accommodation is necessary for occupational activities in institutions devoted to the care and treatment of ex-service men, the fact must be borne in mind that under the provisions of the Vocational Rehabilitation Act many of the men, before leaving the sanatorium as arrested cases, enter upon courses of pre-vocational education, leading to subsequent vocational training for some new occupation. Such work is also of value in helping to harden patients physically while they are still under medical supervision. Provision should therefore be made in a sanatorium not only for the work which is given for therapeutic purposes, but also for pre-vocational work which will lead to or from an introduction to specialized instruction after a man leaves the institution.

"*Accommodation required.*—Until a man reaches the fully ambulant stage, practically all the occupational therapy work can be done either in the wards or on the porches in the hospital, and in the semi-ambulant patients' quarters. It is convenient, therefore, to have a store closet for materials or, better still, a small room on each floor of the hospital building and in each of the pavilions for semi-ambulant patients. Beyond that, an office for the chief aide, a storeroom for supplies, and a room with a bench or two where work done on the wards can be finished, will usually meet the needs of the work which is given to patients who have not reached the ambulant stage.

## Vocational Buildings for Ambulants

"For patients who have reached the ambulant stage, a much wider range of work can be undertaken. Various rooms are required, and there is need for special quarters in what may well be termed a 'vocational building.'

"Broadly speaking, the work may be divided into classroom subjects and shop work. The classroom subjects will vary scarcely at all in different parts of the country, but the shop work may be supplemented or varied by gardening and agricultural work where climatic and other conditions permit.

"The exact number of rooms to be planned will depend upon the size of the hospital, but provision should be made so that at least seventy-five per cent of the ambulant patients can be accommodated, either in classrooms or shops, at one time. It may be considered that this is high, but it must be remembered that the hours of 'exercise' are limited; also, that semi-ambulant patients nearing the stage of full exercise are often directed by the physician to take periods in the classes or shops.

## General Plan of School

"*Suggestions for rooms.*—Administration:

(*a*) An office for the chief aide; say, 10 by 12 feet.

(*b*) A storeroom for materials; say, 10 by 12 feet.

(Continued on page 294)

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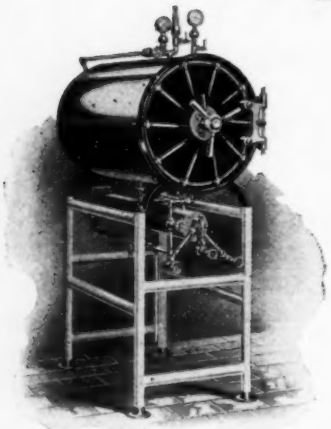
# These Four Units Are Essential for Complete and Positive Sterilization



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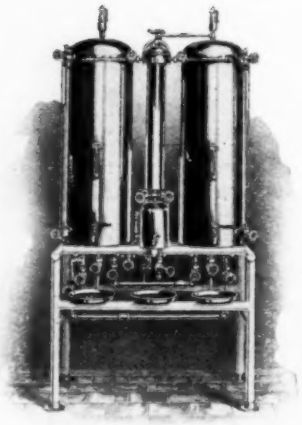
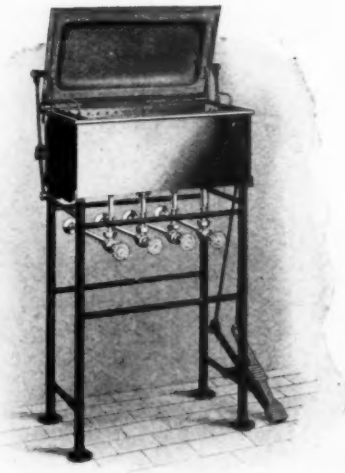


THE importance of *freshly* distilled water in making certain solutions is recognized by Castle engineers. To fulfill this requirement they have added a water still to the pair of water sterilizers. By these not only may raw water be quickly sterilized but distilled water can be economically produced in fairly large quantities.



THE Castle Instrument Sterilizer for the surgery is the embodiment of all that is superlative in instrument sterilizing. The improved pedal lifting mechanism raises and lowers both cover and tray.

THIS Castle Utensil Sterilizer with hydraulic lift is built for very severe usage. Heavy gauge copper, re-enforced, is used, and seams are both rivited and sweated. A foot valve controls the automatic tray lift. There is no chance of the tray binding.

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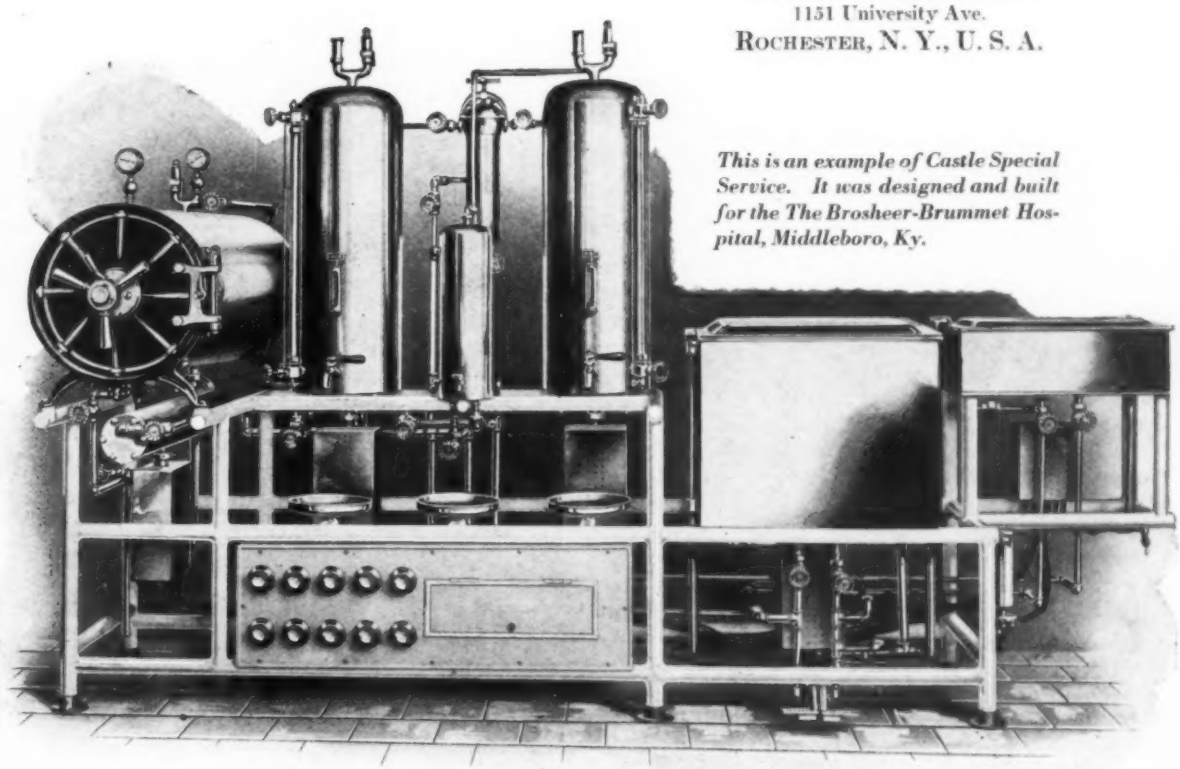

*This is an example of Castle Special Service. It was designed and built for the The Brosheer-Brummet Hospital, Middleboro, Ky.*

(*c*) A room for finishing (assembling, varnishing, dyeing, enameling, etc.); say, 12 by 18 feet.

(*d*) An office for the vocational director; say 10 by 12 feet.

(*e*) A storeroom for stationery, books, and other supplies for academic classes; say, 6 by 12 feet.

(*f*) A storeroom for shopwork supplies; say, 10 by 25 feet.

(*g*) Toilet rooms for male and female instructors.

(*h*) Toilet rooms for students.

"*Classrooms.*—Because of the individual nature of the instruction, classes should not exceed sixteen students. The floor space should provide not less than 35 square feet per student; thus a room 20 by 28 feet would accommodate sixteen students. The room should be lighted on one of the long sides, with windows of the side-pivoted type preferably, the light to come from the left of the students. The radiation should be installed below the windows, and a foul-air vent arranged either in the ceiling or high up in the opposite wall. Standard blackboards of slate (or, in temporary construction, of hyloplate) should be installed on the wall at the rear of the teachers' desk and on the wall facing the window. A sink for washing blue prints should be installed in the drafting room; size, about 18 by 30 inches.

"Generally, four branches of study should be provided for:

(*a*) Academic.

(*b*) Typewriting.

(*c*) General commercial.

(*d*) Mechanical drafting.

"Provided that properly deadened floors are installed, the classroom may be in the upper story of the building in which the shops form the ground floor.

### Workshop Requirements

"*Shops and laboratories.*—While suggestions will be made as to sizes of units, it is well to arrange that the interior partitions be of light construction and installed in such a manner that they may easily be moved, should changes be necessary.

"Factory-type windows are desirable and should extend to the ceiling. At least fifty per cent of the sashes should be capable of being opened, preferably horizontally, on side pivots. Light on two adjacent sides of the room is desirable and the window-glass area should not be less than one-fourth the area of the floor space.

"Each unit should accommodate from ten to twelve students and should provide not less than 150 square feet of space for each student. The floors should be of heavy groove-and-tongue batten or wood block. Ceiling should be not less than thirteen feet high.

"The following are typical of the subjects often given in shops in a sanatorium for tuberculous ex-service men:

(*a*) Watchmaking, jewelry, engraving, etc.

(*b*) Tailoring.

(*c*) Shoemaking (provide for a five-horsepower electric motor).

(*d*) Commercial art.

(*e*) General technical shop or laboratory, used for arts and crafts work of more advanced type than is possible in bedside and ward occupations; also for 'try-out' work in cases where the indications as to a student's capacity, inclinations, etc., are not clear. (Provide for a ten-horsepower electric motor.)

"In sanatoriums in which gardening, agriculture, and other outdoor work form a part of the active features of the vocational classes, it is probable that shoemaking or tailoring or both would be omitted. Instead, a laboratory for science related to the outdoor studies would probably be installed.

"In each workshop water should be laid on and a kitchen or other working sink installed."

## SHOULD OCCUPATIONAL THERAPY BE COMMERCIALIZED?

"The fallacy of putting occupational therapy on a commercial basis" is an expression used in a recent communication addressed to this department. It is delightful to have something to quarrel about. If there were no differences of opinion, occupational therapy would be far less alive and stimulating. Aides, directors and interested medical men are cordially invited to write to the editors, expressing their opinion on this important question: *"Should occupational therapy be concerned with the commercial value of its products?"*

Some of the leaders in occupational therapy have always stood out frankly and firmly for a modified commercialism. "The more valuable the product, the better the therapeutic effect" has been one of their articles by faith. Like most catch phrases, it expresses only a partial truth. Probably no experienced occupational therapy worker is so far gone in commercialism as to assume that a poor piece of work may not represent a veritable triumph for aide and patient, even though the money value is nil. But is it not up to occupational directors to put enough thought and skill into the preparation of their problems so that a valueless product will be the rare exception? Is it not true that, given the right materials and a proper supervision, the therapeutic work of the handicapped may almost always be good enough to command a legitimate market? May it not be that a really valueless product reflects upon the skill of the aide rather than upon the patient?

Our efforts in occupational therapy would be wholly justified if no product of commercial value ever resulted from the labors of our patients, but if we can add the encouragement, the delight, of a small money return, shall we not be wholly justified? Can we afford to ignore human nature that wants something tangible, more tangible even than returning efficiency as a reward for labor accomplished? Is not the laborer "worthy of his hire" even if he happens to be an invalid? We have, no doubt, a right to spoil an unlimited quantity of good material if by doing so we may even in the slightest degree improve the courage and effectiveness of our patients. But have we a moral right to spoil that good material if, by a little more thought and skill on our part as teachers, we may see it converted into a legitimately saleable product for the benefit of the patient and for the support of the system?

These are interesting and important questions. Serve the good cause by reporting instances where the commercial spirit has interfered with the best therapeutic results. Report to us, also, cases in which the money value of occupational therapy products has actually helped the patient to make progress toward recovery.—THE EDITORS.

## OCCUPATIONAL THERAPY NOTES FROM MISSOURI

The board of managers of state eleemosynary institutions of Missouri, with offices at Jefferson City, has secured the services of Dr. George P. Ard as state psychiatrist. Much interest is being manifested in occupational therapy, it is declared; departments will be opened as rapidly as high grade graduates with experience can be found.

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In November, 1921, Miss Dorothea E. Fischer opened an occupational therapy department at the Missouri State Sanatorium for the Treatment of Incipient Tuberculosis at Mount Vernon. Miss Fischer is a graduate of the St. Louis School of Occupational Therapy. During 1920-21 she was employed by the Missouri Association for Occupational Therapy as head instructor of the shop for handicapped, and was reluctantly given up for much needed state work.

Mr. T. B. Kidner, institutional secretary of the National Tuberculosis Association, recently visited St. Louis to confer with the St. Louis Tuberculosis Society regarding open air schools and new buildings for Koch Hospital, a city institution for tuberculous patients. He also visited the state sanatorium at Mount Vernon in regard to improvements in buildings there. Returning from Mount Vernon through St. Louis, Mr. Kidner spoke at a luncheon given by the board of trustees of the Missouri Association for Occupational Therapy and at the St. Louis School of Occupational Therapy to the student occupational therapists from various hospitals, and others interested.

## THE AIMS OF THE AMERICAN OCCUPATIONAL THERAPY ASSOCIATION

By G. CANBY ROBINSON, M.D., Vice President.

The American Occupational Therapy Association has been formed for the furtherance of the use of occupations as a therapeutic measure and for the organization of the various interests involved in its development. The membership of the association is composed of individuals interested in occupational therapy from several different points of view. First, we have those who are professionally engaged in this field of work and who have found it of sufficient interest and value to choose it as a career. Secondly, we have physicians who are anxious to see the development of the use of occupations as therapeutic measure; and thirdly, we have individuals interested in the development of occupational therapy as a factor in the social and economic betterment of people who are handicapped and afflicted by injury or illness.

Although the points of view are necessarily somewhat divergent in these three groups, it is important that they should have in the association a common meeting ground where all can combine to accomplish certain purposes that are essential for the further development of occupational therapy. These purposes may be considered as the maintenance of standards, the development and recognition of the usefulness of occupational therapy, and the winning of a place for it where it will become a component factor in the treatment of disease and injury.

It is especially important at this time that standards of work should be maintained at a high level. Many workers have been drawn into the field hurriedly on account of the great need that the war has presented, and their preparation has necessarily been rapidly obtained. The association should endeavor to encourage further development of skill and knowledge for these workers and should do all that it can for better preparation in the future. The early days of a general movement, such as the association represents, are always critical, and the future of occupational therapy will depend in a large measure on the efficiency, tact and earnest endeavor of those actively engaged in the work. The training that is offered in the several schools that have been established can only give the necessary requirements for the future development of the worker, and it should be a function of the association to see that important positions are filled by the people most competent to discharge their duties, who will carry on the work in such a way that it will be effective and impressive. To this end, a system of registration should be installed and a knowledge of training and personal fitness should be catalogued.

The association should take every opportunity to educate the medical profession regarding the usefulness of occupational therapy. It should aim especially to arouse the interest of members of staffs of general hospitals. Unless the profession is interested and alive to the possibilities of the work, its progress will be slow and difficult. The therapeutic value, as well as the advantages in the improvement of hospital morale and general betterment of the individual, should be emphasized wherever possible. It is not likely in the beginning before a satisfactory demonstration can be made that funds of general hospitals will be devoted to this work. It is therefore desirable that associations be formed in various communities, preferably as branches of the national association, which will raise funds and endeavor to introduce the work into institutions of various types.

## BOSTON GETS NEXT A. O. T. A. CONVENTION

At the recent Baltimore convention, four cities were considered for the 1922 annual meeting,—Boston, Milwaukee, Colorado Springs, and Augusta. A vote was taken and Boston was chosen, but because the members were not all present and because the invitation to Georgia came from the office of the Surgeon General of the United States Public Health Service, offering the use of the auditorium of the government hospital and other inducements, it was thought wise to rescind the vote and leave the decision to the House of Delegates. That body has now voted as follows: Boston 11, Milwaukee 7, Augusta 3, Colorado Springs 2. The association will, therefore, meet in Boston. It would seem that Milwaukee is likely to be the choice for 1923.

The president, for the society, has issued thanks to the other cities for their cordial invitations.

In selecting Boston as the next meeting place, the House of Delegates was guided by the fact that in no other vicinity has occupational therapy gained a firmer hold or has more to show of actual progress. Among the institutions concerned with occupational therapy within easy reach are the Boston School of Occupational Therapy, the Occupational Therapy Bureau, the Tide-Over League, the Naval Hospital at Chelsea, the Parker Hill Hospital of the Public Health Service, the Massachusetts General, the Peter Bent Brigham and Robert Brigham Hospitals, in Boston proper, Devereux Mansion and the Medical Workshop at Marblehead.

To obtain reduced rates on the railroads and at the hotels, it will be necessary to guarantee a large number of delegates. This guarantee must come at an early date. The pledge will not be binding, but every member of the American Occupational Therapy Association who lives outside of Boston and who expects to go to the convention next fall is requested to send at once his name and address to the president of the association, Dr. Herbert J. Hall, Devereux Mansion, Marblehead, Mass.

## DIGGING IN

Occupational therapy, since the demonstration of its value in the military hospitals, has been finding a small and somewhat precarious place in the general hospital system. There can be no doubt of the final full acceptance of the work as a necessary hospital auxiliary, but for the moment one of the chief difficulties in the way of progress is lack of space for supplies and equipment.

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The modern hospital has, of course, been built in a way to use every available inch of room for medical, surgical and nursing purposes. Welcome enough by the average well informed hospital superintendent and staff, the trouble has been to find room for occupational therapy. The aides have literally had to dig in. Greatly to their credit, they have carried on successfully in wards, corridors, and basements, with perhaps only a small closet shared with mops and brooms for their supplies. It is, therefore, most encouraging to find that in all new government hospital construction ample room is being provided for curative workshops.

How the matter will be handled in existing civilian hospitals remains to be seen. There is almost always considerable basement space which could be utilized without fire risk, but ideally there should be an industrial building on the grounds, and connected with the main hospital corridors, a building available for out-patients as well as ambulatory ward patients. Ultimately it may be desirable to install various types of automatic machines, so that crippled patients may actually be trained in factory work before they are turned out as cured. If this is done, a somewhat detached building will be necessary to avoid objectionable noise.

The time has already come when hospital architects should include in their plans for new construction adequate space for occupational therapy. The matter calls for no argument. The patient who has not learned to use his injured limbs under skilled direction is no greater credit to the hospital than he would be if he were discharged with a wound half healed or with a fever.—EDITORS.

## WOOD-SHOP WORK FOR CONVALESCENTS

By MARY E. RUHL, Supervisor of Occupation, The Burke Foundation for Convalescents, White Plains, N. Y.

The work of convalescent patients in the wood-shops of the Burke Foundation has resulted in the production of many useful and beautiful articles, as well as in improved mental and physical conditions in the patients. Convalescents enjoy this wood-work, and frequently the handi-

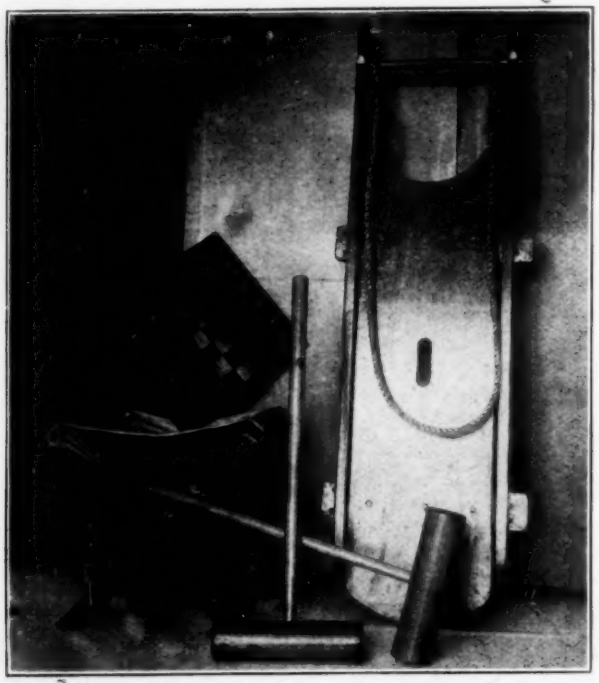

Figure 1. Iron braced sled, stool, and croquet mallets, made by convalescent patients at the Burke Foundation.

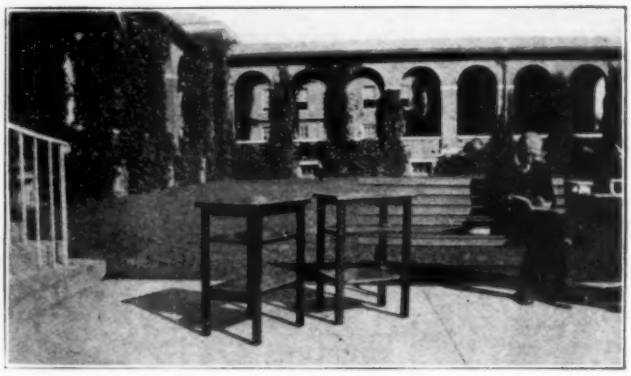

Figure 2. Stained tables, made at very low cost, by the patients at the Foundation.

Although the hours actually spent by the patient in the work shops are short—the patient on the average spending but one hour a day in the shop for as short an interval of time as ten days—this work-therapy has resulted in important savings to the institution.

Among varied recent products made by the patients are bedside tables, chest-settees, sleds, stools, checkers, croquet sets, and reclining chairs. All are made of cypress. The sleds (See Fig. 1) are iron braced and shod in the engineer's shop. (Note rear projection of inch-thick top board, giving more capacity.) The stools (See Fig. 1), reduced to the simplest lines, are very useful, replacing expensive chairs in many situations, and serving for foot rests. They are easily carried about the grounds.

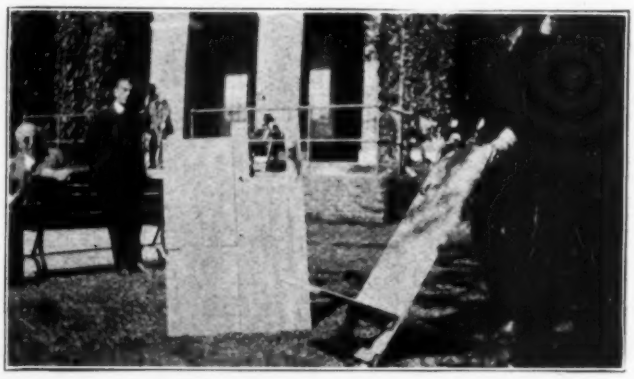

Figure 3. This illustraton shows the reclining seat made by the patients, in its finished form, and in process of making.

The little tables (See Fig. 2) are especially satisfactory and economical. One board, of any width above twelve inches, cuts for the top, and the finish is of varied stain, in preference to paint. Drawers are avoided for administrative and hygienic reasons. The low cost is a feature.

The reclining seat (Fig. 3), to be left outdoors, is commended for simplicity, having no blocks nor bracing. Any width board serves. The slopes and angles may be changed by placing of the cross-pieces. This seat may be made to fold flat with the use of hinges; however, made in this way, it has a tendency to get out of order. The cost of the recliner is but little over one dollar.

## REHABILITATION COURSE AT HARVARD

Harvard University has issued an announcement relative to a summer school course in "Rehabilitation and Re-education of Handicapped Persons," as a unit of the work of the Bureau of Vocational Guidance of the Graduate School of Education.—*Vocational Summary, April, 1921.*

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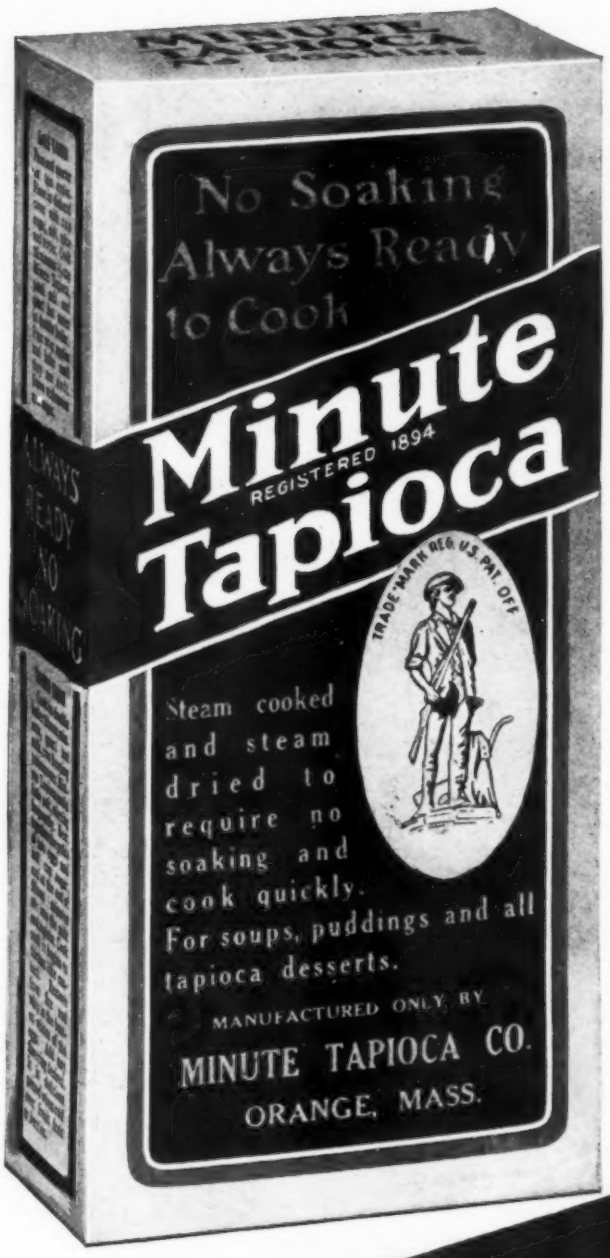


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Minute Tapioca is made from the finest tapioca flour by our patented processes. It is carefully steam-cooked and thoroughly inspected. An experienced food chemist has constant supervision of our entire manufacturing processes. So, in Minute Tapioca you have tapioca in its purest form.

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It can be thoroughly cooked in fifteen minutes and is always ready for use. It is high in nutritive value; is easily assimilated, and is especially valuable in many cases of convalescence. It is one of the standard items on the dietary in the majority of hospitals.

Ask your wholesale grocer for the new five-pound Institutional size package of Minute Tapioca. If you have any difficulty or delay in getting it, let us know.

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# Hints to Hospital Superintendents

## "WILLFUL WASTE," ETC.

"Save Money to construct the new hospital buildings" is a good slogan for hospitals just now when many hospitals are cramped for space and hoping to build in that golden future when construction prices come down. This slogan is printed at the top of a little folder sent out by the Presbyterian Hospital of Philadelphia which contains on its first page the following "hints" which might well be passed on by the superintendent to his hospital:

1. Cordial cooperation in and between departments is essential.

2. Physicians, chiefs, assistants and residents, as well as nurses and employees, are requested to bring about the economic use of drugs, dressings, appliances and surgical supplies, as well as all food supplies.

3. *Do not* use an appliance or a surgical instrument, except for the purpose for which it is intended.

4. Save the worn out article or the broken, in order to obtain a new one on requisition.

5. It is sometimes alleged hospitals are wasteful and extravagant. Help to avoid such criticism.

6. Do not light an electric lamp or gas when not necessary. To do otherwise is wasting money. If you find an unnecessary light burning, turn it off. All lights not actually needed should be extinguished by 9 p. m.

7. Do not fill ice-water pitchers full of ice. Use one-third ice and two-third water. A very large saving in money will result from this practice.

8. Keep ice chest and refrigerator doors closed.

9. Turn off hot and cold water faucets. Water costs money.

10. Turn off steam from radiators, when heat is not needed. This will save coal.

11. Blank forms cost money. Do not use them for purposes for which they were not intended.

12. Old rubber is valuable. Do not throw any away. Keep rubber in a cool place. Do not allow any form of grease on rubber, as it causes it to rot.

13. When you have time, do not take the elevator to go up or down one or two flights of stairs.

14. Kindly cooperate in the economical use of linen.

15. China is very expensive. Observe the utmost care in handling.

16. Lack of care in the use of food supplies wastes money. Order only what is needed, and return all unserved food to the kitchen.

17. Before making requisitions, assure yourself that it is *absolutely* necessary.

18. Each ward or department should keep an accurate account of all supplies.

19. Supplies are not to be taken from the hospital.

20. Physicians, nurses and others are requested to practice the utmost economy in the use of guaze, cotton, etc.

21. Loss of time is wasteful and extravagant. For instance: Late on duty often causes confusion and dissatisfaction. Late at meals, not only means delay in going on duty, but extra work in the dietary service and in other departments.

22. Handle all hospital property and equipment with the same care you would if you had paid for them with your own money. Our repair bills are enormous.

23. Request for repairs should be made by the head of the department on blanks provided for that purpose and sent to the Superintendent's office.

24. When we all unite in small economies, it will produce a large economy for the hospital as a whole.

25. The use we make of our present facilities will, to a large extent, determine how soon we can construct the new buildings.

26. The hospital has been carefully operated in the past. Let us emulate our predecessors in keeping our institution in the forefront of the hospital world. To do this we must be careful in our use of all material, equipment, food and other supplies.

## SMALL HOSPITALS MIGHT HAVE PRODUCE DAY

The hospitals of British Columbia have a practice which might be followed by small hospitals in any rural community. A certain day in September is set as "Produce Day" when the hospital is the recipient of gifts of potatoes, fruit, and other produce from the surrounding community. This is an annual day in British Columbia and during the past two years it has met with splendid response.

Another economy which it is more possible for the small hospital to carry out than for the large one is that of putting up its own canned fruit for the year. In British Columbia this is now being done, usually by the women of the community or by the woman's auxiliary.

## TO PREVENT STEAM ON LENSES

The clouding of the lenses by steam is a common difficulty encountered by persons who wear spectacles. In the sterilizing rooms, kitchens, operating rooms and laundries of the hospital steamed lenses constitute a great annoyance. There is a commercial preparation on the market which when rubbed over the surface of spectacle lenses temporarily prevents them from steaming. This preparation can be obtained from most opticians at a small cost. A simpler remedy even than this is said to be quite successful. The lenses are rubbed with dry soap, the soap washed off, and the lenses then polished for wearing.

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# QUERIES AND ANSWERS

## LOCATING A CHILDREN'S HOSPITAL

To the Editor of THE MODERN HOSPITAL:

May I have your opinion regarding the site of our new children's hospital? My board would like to be satisfied that it is acting wisely in voting to keep the hospital where it was originally planned to erect it. An effort is being made by disinterested outside organizations to persuade us to change to a part of the city in which there are only rich homes, and to a site which is four blocks from a car line and about six miles from the center of the city. One large hospital has had to close its out-patient department for lack of cases, although it is directly on a car line and not nearly so far out. We have kept a spot map of our cases, and find that we are about in the center of our work. We have occupied our present location for nearly twenty years and there are several car lines within a block of the hospital. The members of the board feel that since we are conducting a charity hospital with a large out-patient department, the institution should be located near the homes from which our patients come.

HOSPITAL PRESIDENT.

In locating a hospital accessibility is an element the importance of which is accentuated in the case of a hospital conducting an out-patient department, and doubly accentuated in the case of a hospital conducting an out-patient department for children. Other things being equal, a site which is accessible to the patients whom the hospital serves and to the physicians who are served by the hospital is to be preferred. Put the hospital where the patients cannot get at it conveniently, and they may be tempted to go elsewhere; place the hospital in a location where it is difficult for the visiting physicians to get to it, and their gratuitous service to ward and dispensary patients is apt to be curtailed.

Accessibility is only one of the important site values to be considered, however. Characteristics to be evaluated are the size of the site; its shape, contour, and hence its adaptability to free planning; the character of the surroundings (as tending to introduce or exclude noise, smoke, etc.); the prospect of future neighborhood development of a desirable or undesirable kind; evidence of the shifting and growth of population, etc.

So far as hospital patients (in-patients) are concerned, they go to the hospital but once, as a rule, and remain two to three weeks. This makes it worth while to put up with some inconvenience in the matter of approach, provided the hospital is thus enabled to replace obviously bad and unsuitable surroundings with the tonic outlook which a suburban or semi-suburban location affords. Other things being equal, city locations facing public parks are best; those in residential districts next best; and those in noisy or smoke-laden tenement, commercial or factory districts, least attractive. But the choice of a hospital location cannot intelligently be made without careful consideration of all of the local factors involved, as well as with due regard to hospital principles which are applicable generally.

A hospital which is famous for good service will attract patients whether the hospital is accessible or not. It is possible to cite instances of the best type of general hospital, often one with a university connection, and always one possessing a notable faculty, located in the finer residential districts, and comparatively far away from the homes of the poor, but nevertheless freely patronized by the poor, who, having confidence in the institution and its staff, willingly overlook the inconveniences of travel. The degree of inconvenience is, however, a factor.

An inaccessible hospital will be sought more freely by adults than by children. Actual analyses of out-patient services, attached to large and important general hospitals, reveal a striking contrast between the residential sources of adult and immature patients. In one instance two-thirds of the adult patients visiting a large dispensary are distinctly not neighborhood cases, while nine-tenths of the children who are brought to the dispensary come from the immediate neighborhood. The reason is obvious. An adult dispensary patient not acutely ill, probably out of work and able therefore to spare time, will travel miles to reach a desirable dispensary, especially if the dispensary is located near a car line. The mother of a family, however, who is burdened with routine household cares, as well as with the care of a sick child, cannot conveniently abandon her duties in order to spend half a day on a journey to a distant dispensary; besides which, it may be physically impossible for her to carry so far the sick child for whom treatment is sought.

To sum up, then, accessibility is to be taken into serious consideration in the selection of any urban hospital or dispensary site. Nearness to residential sources is more important in the case of a dispensary than in the case of a hospital, and more important in the case of a children's dispensary than in that of an adult dispensary. Other site values should be likewise considered. A hospital with an outstanding reputation for efficient medical service will attract patients no matter how far away their homes may be, but accessibility should not, on this account, be disregarded in choosing a site.—S. S. GOLDWATER, M.D.

## FOOD PREFERENCE OF PATIENTS

To the Editor of THE MODERN HOSPITAL:

In serving meals do you consider the food preference of patients?

DIETITIAN.

The food preference of patients is a rather difficult one to handle in an institution, but is a matter that should be given very careful thought, and everything possible should be done to comply with the wishes of the patient. In the private pavilion this can be very easily accomplished by furnishing a menu card with certain selections, with the understanding that these selections be made before the time of serving meals.

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# BOOK REVIEWS AND CURRENT HOSPITAL LITERATURE

## BACTERIOLOGY

By Estelle D. Buchanan, M.S., recently Assistant Professor of Botany, Iowa State College, Ames, and Robert Earle Buchanan, Ph.D., Professor of Bacteriology, Iowa State College, and Bacteriologist of the Iowa Agricultural Experiment Station, Ames. Revised Edition.[1]

Buchanan's Bacteriology, which college students in home economics have borne under their arms and on their minds for these last nine years, appears in new guise. The publishers have not altered its jacket—it still wears the Lincoln green—but its authors, Professors Estelle D. and Robert E. Buchanan of Iowa State College, have made numerous text changes to bring it abreast of speedy advances in the science. For example, the work of the Committee on Nomenclature of the Society of American Bacteriologists has made advisable the revision of the scheme of classification and of names of bacteria. The chapter on the effect of physical agencies on microörganisms has been extended by consideration of these effects upon the life phases of a culture. Marked advance in the knowledge of the scientific basis of food preservation required an elaboration of that topic. Increased emphasis has also been placed upon panary and lactic acid fermentations. The second edition of Buchanans' more nearly satisfies the cry of teachers of general science who have sought a non-technical text, and well fulfills its old function in the special field of household science.

## SURGICAL AND GYNECOLOGICAL NURSING

By Edward Mason Parker, M.D., F.A.C.S., Surgeon to Providence Hospital, Washington, D. C., and Scott Dudley Breckinridge, M.D., F.A.C.S., Gynecologist to St. Joseph's Hospital, Lexington, Ky. With 134 illustrations in text. Second edition, revised.[2]

However much the opinions of medical men may differ in regard to the amount of education necessary for the prospective nurse, one always finds the exponents of various specialties convinced that a knowledge of nursing technique required in their particular field is *essential.* This text on surgical and gynecological nursing written by two eminent surgeons exemplifies this point of view. It is a very complete presentation of the body of knowledge that has come to be known as "surgical and gynecological nursing" with the inclusion of only such portions of surgical bacteriology, pathology and symptomatology as is necessary to emphasize the importance of certain nursing duties.

As stated in the preface, "the desire has been constant to prepare a text-book that would supply those needs that were most apparent to the lecturer and operator." A careful study of the book justifies the statement that this aim has been met.

The book is divided into five parts: I. Infection; II. The Field of Surgery; III. Minor Technic in Surgical Nursing; IV. The Patient; V. The Operation; VI. Supplementary Chapters, including one on "The Personal Attitude of the Nurse."

In Part III the chapter on the Carrel-Dakin treatment of infected wounds is an important and new addition, emphasizing as it does the exacting technic, which falls to the nurse.

In Part IV the chapter on Anoci-Association, the technic of which involves the avoidance of suggestions or associations of harm, is of extreme importance and represents a comparatively recent development of modern surgery.

Many illustrations add to the value of the book.

## THE DEFECTIVE, DELINQUENT AND INSANE

By Henry A. Cotton, M.D., Medical Director, New Jersey State Hospital, Trenton. The Relation of Focal Infections to Their Causation, Treatment and Prevention. With a Foreword by Adolf Meyer, M.D., Director of the Henry Phipps Psychiatric Clinic, Johns Hopkins University.[3]

The evaluation of focal infections is one of the outstanding contributions of the twentieth century to medicine. Dr. Cotton, author of "The Defective, Delinquent and Insane," is recognized as among the foremost of those who are pushing to its logical conclusion the freeing of the organism of these insidious dangers. In this volume he discusses the physical causes of insanity and methods of treatment actually carried out at the New Jersey State Hospital at Trenton with successful results. In his discussion Dr. Cotton lays emphasis on the physical nature of insanity and the necessity for widespread knowledge of its causes. The simple language in which the author clothes his ideas makes the book completely intelligible to the layman. Detailed analyses of twenty-five cases treated at his own institution, graphic presentation of statistical material, drawings of pathological specimens and radiographic studies add to the interest of the work.

## BOOKS RECEIVED

**SUBMUCOUS RESECTION OF THE NASAL SEPTUM.** By William Meddaugh Dunning, M.D., Consulting Otologist, Fordham Hospital, N. Y. C. and Manhattan State Hospital, N. Y.; Consulting Laryngologist, Ossining City Hospital, Ossining, N. Y., The Alexander Linn Hospital, Sussex, N. J.; Assistant Surgeon, Manhattan Eye and Ear Hospital, N. Y.; Surgeon, Bronx Eye and Ear Infirmary, N. Y. Surgery Publishing Company, New York, November, 1921.

**SOME MEDICAL ETHICAL PROBLEMS SOLVED.** By Rev. M. P. Bourke, A.M., LL.B., Superintendent of Hospitals for the Diocese of Detroit; Chaplain of St. Joseph's Sanitarium, Ann Arbor, Mich. The Bruce Publishing Company, Milwaukee, Wis.

1. The Macmillan Company, New York, 1921.
2. J. B. Lippincott Company.
3. Princeton University Press, 1921.

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